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COVERS:

Front - Great Plains Indian Paintbrush, (*Castilleja seesiliflora)*, with white flowers, north of Whitewood, SK June 2005. Photograph by P.M. Catling

Back - An immature ibis associating with two adult White-faced Ibis at Whitewater Lake, MB, September 11, 2005. Photograph by Christian Artuso

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FIRST DOCUMENTED BREEDING RECORD OF WHITE-FACED IBIS IN MANITOBA

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Ibis are curve-billed, long-legged wading birds that occur primarily in tropical and warm-temperate regions. Three ibis species occur in North America, two of which belong to the genus *Plegadis* (White-faced Ibis–*Plegadis chihi* and Glossy Ibis–*Plegadis falcinellus*) and show similar traits and colour patterns, which can potentially confound identification. Both *Plegadis* ibis species are rare visitors to Manitoba, but the White-faced Ibis does occur with greater regularity.

The White-faced Ibis is a highly mobile species and breeding adults sometimes exhibit nomadic behaviour in addition to their regular north-south migrations.[14, 15] In response to the dynamic nature of their breeding

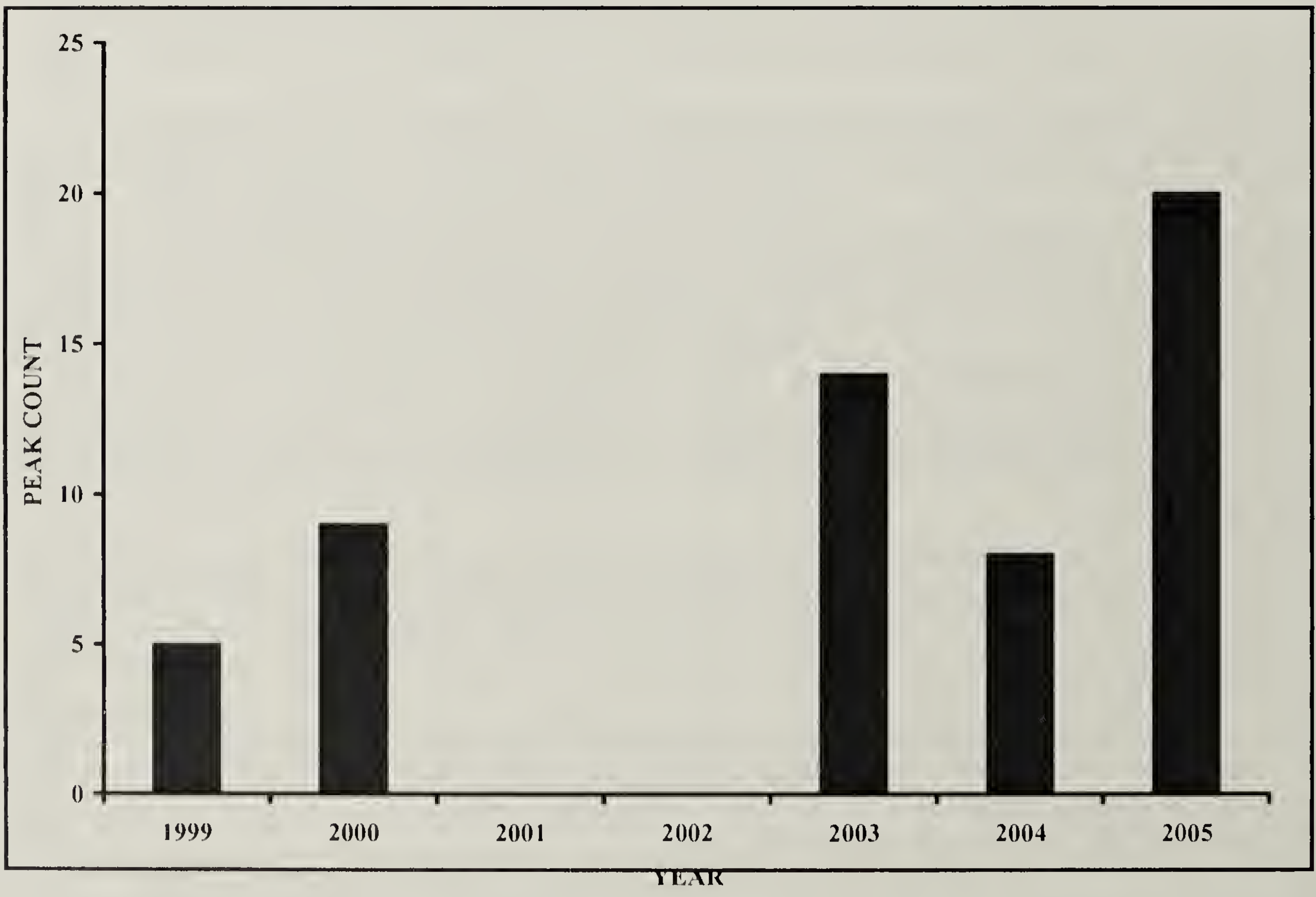

Fig.1. Peak counts of White-faced Ibis at Whitewater Lake between 1999 and 2005.

habitat, which is prone to periodic drought or flooding, White-faced Ibis will readily relocate to new nesting areas when conditions at their established colonies are less than favorable.[15]

Extra-limital observations of White-faced Ibis have occurred sporadically to the north of the core breeding range since the early 1900s. However, these observations increased in frequency during the second half of the 20th century, particularly in the northern Great Plains region.[15] The range expansions that have occurred over the last three decades are attributed primarily to improved nesting habitat management, the banning of DDT and other pesticides and improved breeding success at major colonies.[15]

In Canada, the earliest confirmed record of the species was an immature specimen collected in 1907 in British Columbia.[3] Across the prairies, the White-faced Ibis was first reported in Manitoba in 1934, Alberta in 1941 and Saskatchewan in 1976.[3, 9, 11] In Manitoba, only 4 of the 16 reports of *Plegadis* ibis between 1934 and 2001 occurred prior to 1989, indicative of a more recent increasing trend over time. These observations occurred primarily along southern Lake Manitoba, at Oak Hammock Marsh and at Whitewater Lake.[11]

All of the Manitoba records from 1934 to 1998 involved single birds only. This changed in 1999 when up to five birds were observed at one time at Whitewater Lake over the course of the summer, increasing to a peak count of nine birds at the same location by 2000.[11] Very few birds were observed anywhere in Manitoba in 2001 (one at Oak Hammock Marsh) and 2002 (five unconfirmed White-faced Ibis at Oak Lake), possibly as a result of drier conditions in the southern part of the province.[11]

White-faced Ibis returned to Whitewater Lake in greater numbers

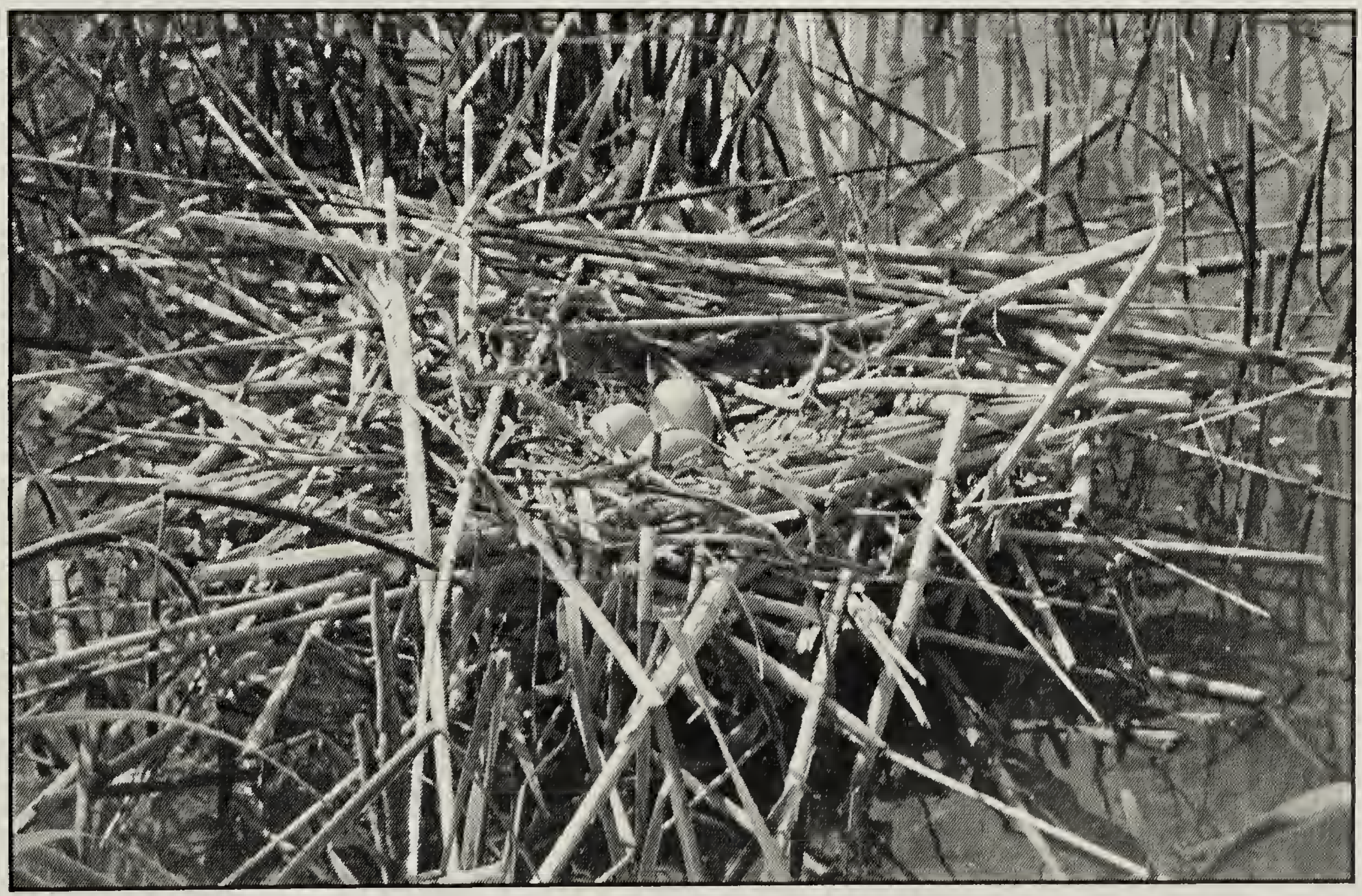

Fig.2. White-faced Ibis nest at Whitewater Lake, MB, July 7, 2005. *Ron Bazin*

from 2003 to 2005 (Fig. 1).[6-8] The highest numbers ever recorded in Manitoba in a single year occurred in 2005, a very wet year, with a peak count of 20+ birds in May.[7, 8] These peak counts suggested the possible presence of a small breeding colony at Whitewater Lake.

North and South Dakota recorded their first White-faced Ibis nesting colonies in 1978, at Long Lake and Sand Lake National Wildlife Refuges respectively.[16-18] In Canada, White-faced Ibis are known to breed in Alberta, at Stirling, Pakowki and Frank Lakes, and near Kininvie. The first confirmed nesting attempt occurred in 1982, followed by two attempts in 1986 and the first confirmed successful nesting in 1992.[2, 3] There is also a record of White-faced Ibis breeding in Saskatchewan at Old Wives Lake in July 2000 where a pair of adults and one young were observed (P. Taylor, pers. comm., 3 May 2006). The White-faced Ibis is considered a rare breeder in Alberta and the Dakotas.[4, 12]

Breeding habitat for the White-faced Ibis consists primarily of inland, mainly shallow marshes with patches of emergent vegetation within which nests are typically situated.[15] This description is consistent with that of Whitewater Lake, in southwestern Manitoba, where the majority of White-faced Ibis have been observed.[10]

Two nests were found by one of the authors (RB) while doing a Franklin's Gull survey at Whitewater Lake on July 7, 2005. The first nest was very large, roughly cylindrical in shape, standing moderately high above the water and contained three pale blue eggs with no markings (Fig. 2). The nest was constructed with both live and dead cattail (*Typha* sp.) which was the dominant vegetation in the area and which occurred in low to moderate density. This description of the nest and eggs is consistent with what is found in the literature for White-faced Ibis.[15] In contrast, Glossy Ibis nest predominantly in woody vegetation (shrubs and trees) or on the ground.[1] Water depth at the nest was approximately 1.5 m, which is much deeper than measurements taken at several other White-faced Ibis colonies, but similar to water depth recorded at a colony in Oregon (1.84 m).[15] A second nest of similar size and construction was observed nearby and contained a single pale blue egg. Up to 15 ibis

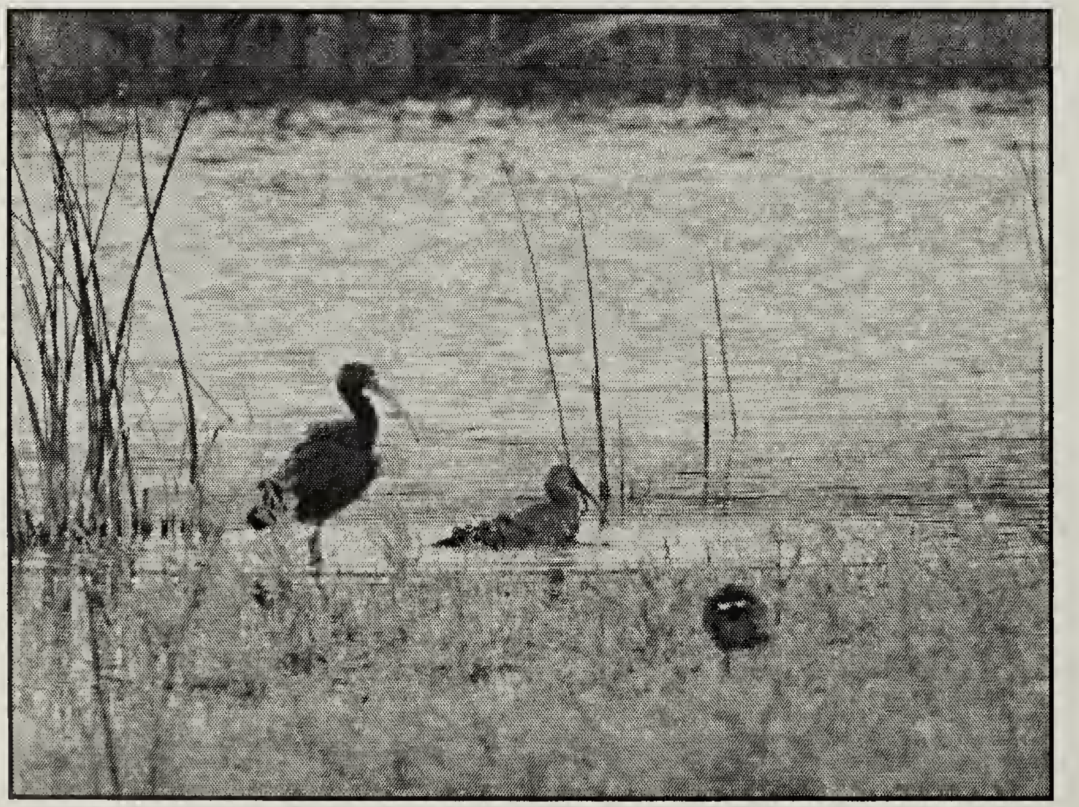

Fig. 3. An immature ibis and two adult White-faced Ibis at Whitewater Lake, MB, September 11, 2005

Christian Artuso

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were observed departing from among the vegetation surrounding the nest locations, but they could not be confirmed as White-faced Ibis.

White-faced Ibis are known to nest in association with breeding Franklin's Gulls and Black-crowned Night Herons.[3, 5, 13, 17] Although large numbers of Black-crowned Night-Herons have been observed in and around Whitewater Lake in the past, no nests or individuals of that species were found in the vicinity of the ibis nests. Franklin's Gulls nest in large colonies at Whitewater Lake and the two ibis nests were located adjacent to an area containing numerous Franklin's Gull breeding adults with young.

On September 11, 2005, one of the authors (CA) and Liis Veelma observed a pair of White-faced Ibis with an immature bird at Whitewater Lake. The two adult birds were both identifiable to species by their red irises and facial skin, which retained some red bordered by white (see back cover photograph). The immature bird associated with the two adults in feeding and preening activities (Fig. 3). It was noticeably smaller than the adults with a shorter bill, pale grey on the underparts with a uniform greenish wash on the wings and upperparts, and prominent pale streaking on the head and neck. The iris and legs were dark grey, and the small, narrow area of dark facial skin, which had a barely discernable upper pale border, contrasted strongly with the paler grey face (Fig. 4).

This is the first documented nesting of a *Plegadis* species in Manitoba. Although the 15 ibis observed near the nests could not be confirmed as White-faced, given the number of birds that were present at that exact location, the number of sightings of that species over the summer at Whitewater Lake (peak count of 20+ White-faced Ibis compared to only two Glossy Ibis), the description of the nests and eggs, and photographic documentation in late summer of an immature bird associating with a pair of adult White-faced Ibis 500 m from the nest site, the evidence strongly suggests that at least one of the nests found at Whitewater Lake was of White-faced Ibis, and very likely both, given the colonial nesting habits of this species.[15]

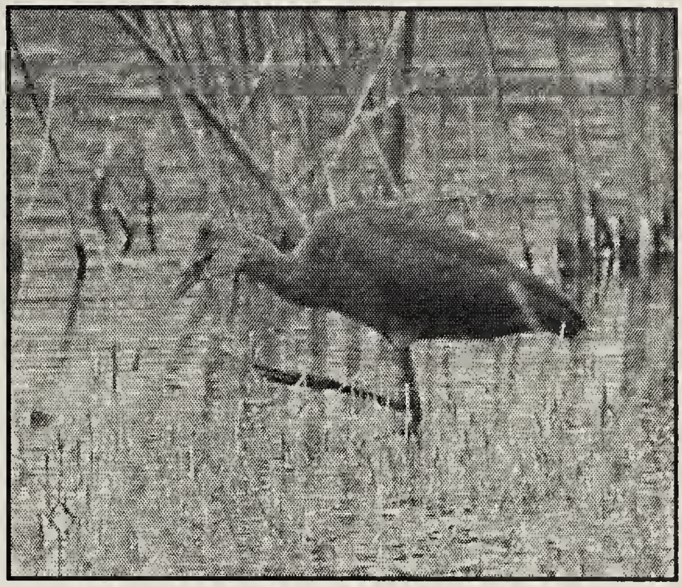

Fig. 4. Immature White-faced Ibis at Whitewater Lake, MB, September 11, 2005 Christian Artuso

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The authors would like to thank Laura Beaudoin, Rudolf Koes, Paul Goossen and two anonymous reviewers for comments on an earlier version of the manuscript.

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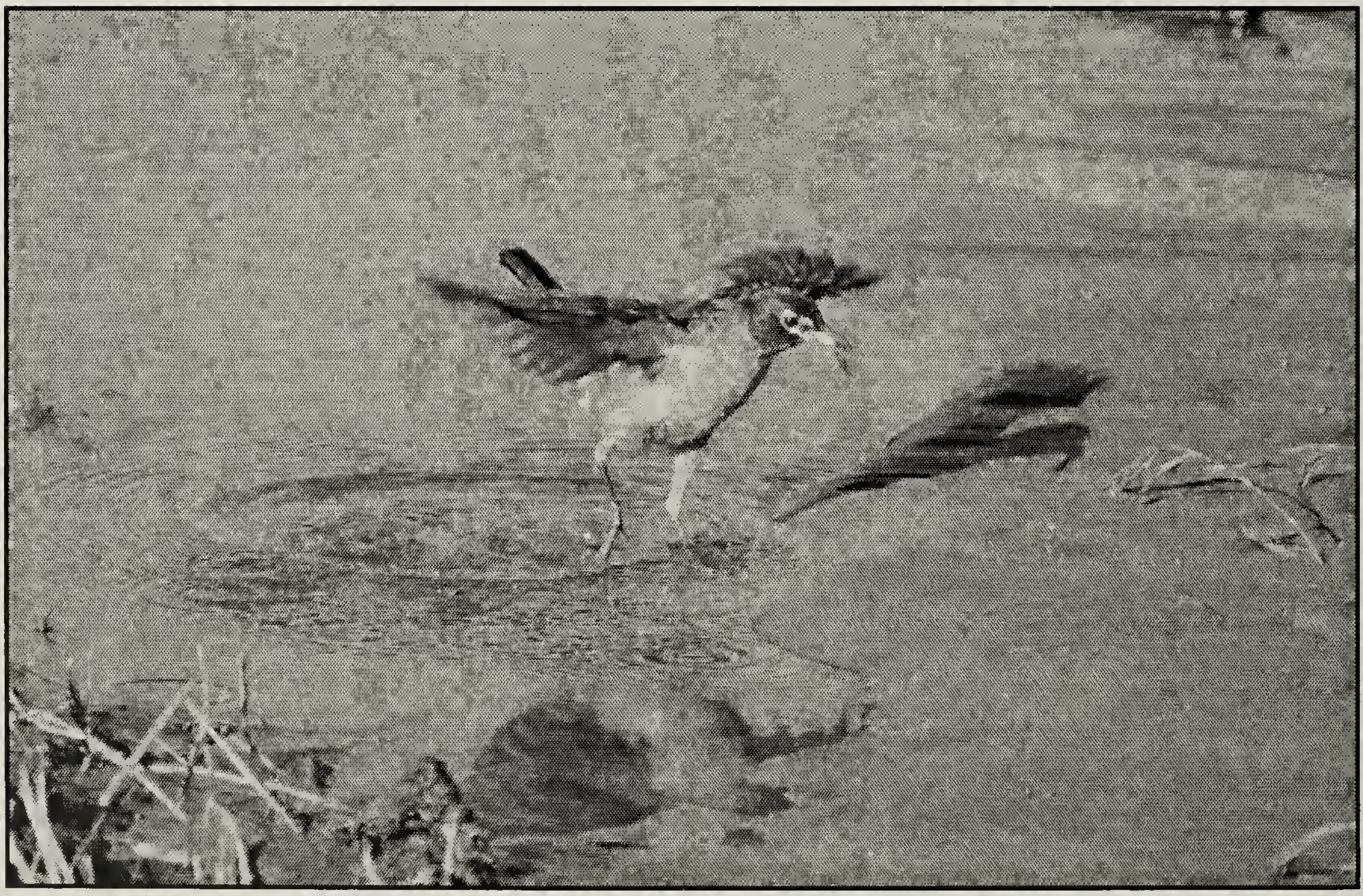

Fishing Robin *Suzanne North*

AN ODDITY: LICHENS GROWING ON AN OLD & WEATHERED BABY SHOE

BERNARD DE VRIES, 29 Hogan Place, Emerald Park, SK S4L 1C1

Introduction

Lichen studies and collecting often provide unexpected findings, such as rare species, new range extensions, unusual habitats or substrates. One such a surprise was a weathered baby shoe found by my wife, Irma, on June 25, 2005 on an small patch of dry open grassland. This very weathered shoe about 14.5 cm long, appeared to be made of leather and canvas stitched with a white cordlike material to a light-colored rubber sole, and had eyelets of hard white rubber (Figure 1). When found it was lying on the ground among scanty vegetation about halfway up an unstable slope showing signs of slumping. The site was 3 km south of Estevan across Woodland Regional Park's golf course in the Souris River Valley and on the west side of Highway 47 going to Port of Estevan at the U.S. border. The area is located in the Moist Mixed Grassland Ecoregion as part of the Prairie Ecozone [3]

The shoe was close to a clump of Prickly Pear (*Opuntia polyacantha*). Associated species were Hoary Sagebrush (*Artemisia cana*), Purple Cactus (*Escobaria vivipara)*, and Creeping Juniper (*Juniperus horizontalis*), with grasses and terrestrial lichens such as: *Fulgensia bracteata* (Tundra sulphur lichen), *Cladonia pocillum* (Rosetted pixie-cup) and *Xanthoparmelia chlorochroa* (Tumbleweed shield lichen). *Xanthoria elegans* (Elegant sunburst lichen) and *Xanthoparmelia mexicana* (Salted rock-shield) were noticeable rock lichens nearby.

Several species of lichens and one species of moss could be identified on the shoe, mainly on margins of the upper surface and, to some extent, on the sides as well.

The following is an annotated list of these plants, which were identified by the author with scientific names, authors and vernacular names from several sources.[1,2,4]

Annotated Lichen List

Caloplaca cerina (Ehrh. ex Hedw.) Th.Fr. (Gray-rimmed firedot lichen), a common crustose lichen on bark especially in open woodlands, was found as scattered apothethia over the shoe's body, mostly on the upper weathered leather and canvas.

Caloplaca holocarpa (Hoffm. ex Ach.) M. Wade (Firedot lichen), a common crustose lichen on bark of various deciduous trees, growing as small colonies or as individuals on the upper body of the shoe and, to some extent, on the sides and upper inside surface.

Candelariella aurella (Hoffm.) Zahlbr. (Hidden goldspeck lichen), a common crustose lichen on exposed calcareous rock, occurred in small colonies often

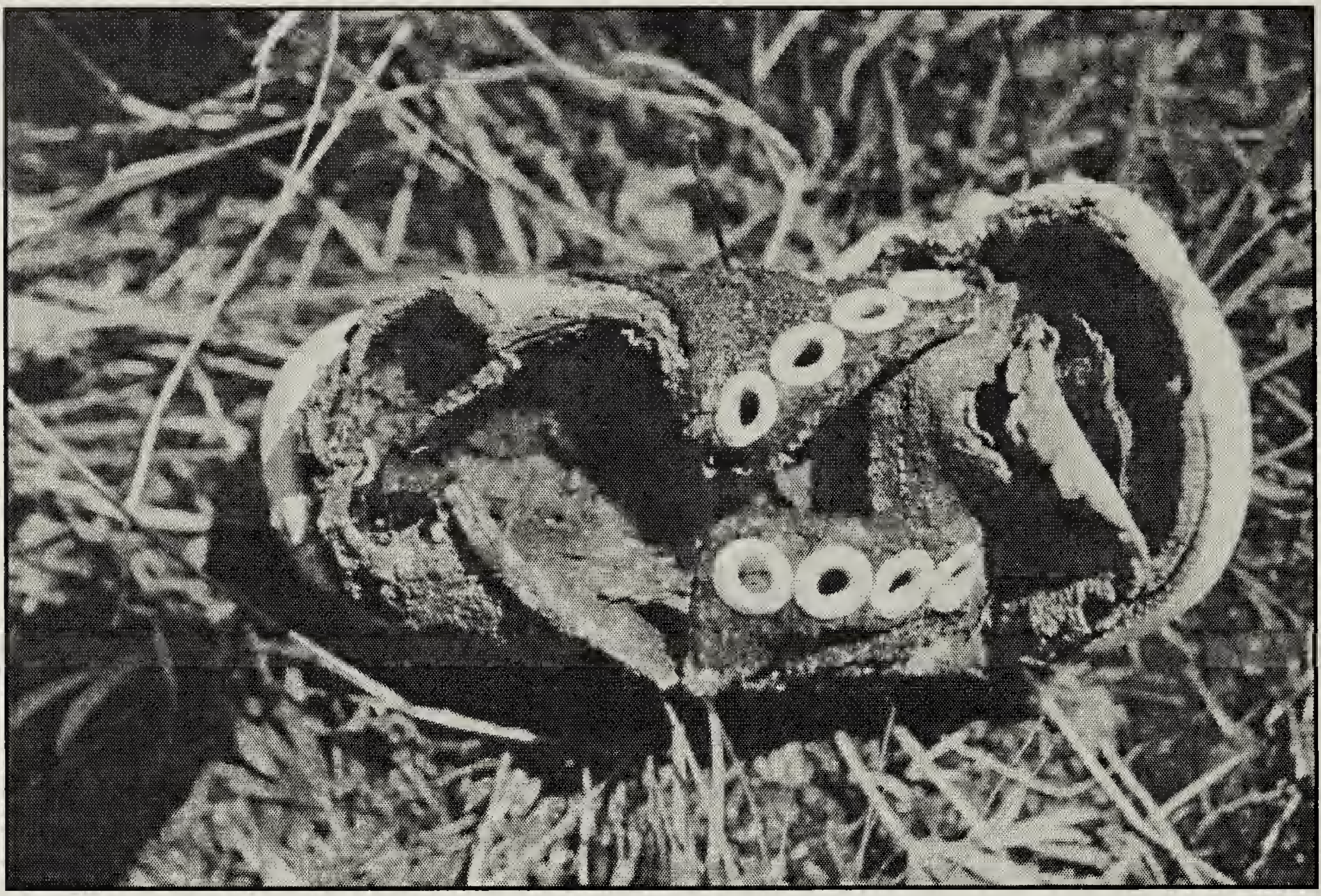

Figure 1. Weathered baby shoe found on 25 June, 2005 *Bernard de Vries*

with Firedot lichens on the upper side of the weathered leather and canvas of the shoe.

Lecanora hagenii (Ach.) Ach. (Hagen's rim-lichen), a small crustose lichen on bark or wood, was found thinly scattered on the upper leather margins.

Placidium lacinulatum (Ach.) Breuss (Brown stipplescale), quite common on dry soil, was found with Hidden goldspeck lichen on the lower side of the shoe on weathered canvas.

Xanthoria elegans (Link.) Th..Fr (Elegant sunburst lichen), a foliose lichen common on all sorts of rock, was only found as very small individuals on a few hard rubber eyelets.

Annotated Moss List

Tortula ruralis (Hedw.) Gaertn., Meyer & Scherb. (Sidewalk moss), a common moss on calcareous soil or rocks and in rock crevices, was growing in a seam between the sole and the body of the shoe.

Discussion

The natural substrates upon which lichens grow–tree bark, wood, soil, mosses, lichens (parasitic), as well as on decaying wood or vegetation–are well known. However, lichens can also grow on various artificial substrates such as old glass, cloth, metal, plastic or leather, providing that the substrates resemble natural substrates in texture, chemistry and water-retaining capacities. For instance, lichens found on old glass are often associated with hard, siliceous rock, while those found on cloth are normally found on soil or dead vegetation. Lichens found on leather usually inhabit wood, and those found on plastic, metal or other material, are generally rock lichens not choosy about their substrates.[1]

This phenomenon was noticed to some extent in the lichens inhabiting the weathered leather, canvas and rubber of the shoe. For instance, Hagen's rim-lichen normally found on bark and wood was found on weathered leather; Elegant sunburst lichen occurring on all sorts of rock, found its niche on the hard plastic eyelets; Brown stipplescale, a soil lichen, was found growing on the weathered canvas of the shoe. These substrates provided a sustainable albeit artificial habitat for these lichens.

The ability of lichens to grow on man-made material or on old bone has often been observed by the author in the field. For instance, *Xanthoria* species (Sunburst lichens) have been found on old bone or deer skulls, and old, dirty car bodies or rusty farm implements may support a variety of lichen growth.

How this weathered baby shoe came to this site and its age will remain a mystery. It is not possible to know how long the shoe has lain on the ground. As the shoe was very weathered, it can be assumed that it was lost quite some time ago. The shoe itself could be 50 years old: it resembles a type of shoe introduced in the early 20th century sold under the brand name of "BAB-EES" Cushion Sole (Saddle Oxfords) and listed by Eatons in their 1955-1956 Fall and Winter catalogue.

How these lichens became established on the shoe at this particular site is another question. The shoe, like natural materials, offers a suitable substrate for certain lichen species to become established. Colonization via recent arrival of aerial born spores involves a complicated process whereby a fungal spore must recognize an appropriate alga to initiate a new lichen body. Wind-blown fragments from colonies of the same species found on soil or rocks in the same area, would be the more common avenue for these lichens to become established. Lichens are for the most part notoriously slow growers, and the fact that only small colonies or individuals were found on old weathered substratum, could suggest that although the shoe was quite old, the lichens growing on it were of recent origin.

Acknowledgements

I would like to thank my wife for discovering the baby shoe and for her assistance in field work.

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"... *swan song* comes from the belief that the mute swan, silent all its life, sings a song just as it is about to die."

Scott Weidensaul, *The Birder's Miscellany*, p.113.

TALLGRASS PRAIRIE IN THE WHITEWOOD AREA OF SASKATCHEWAN

PAUL M. CATLING and BRENDA KOSTIUK, National Environmental Program, Biodiversity Section, Agriculture and Agri-Food Canada, Saunders Bldg, Central Experimental Farm, Ottawa, ON K1A 0C6

Introduction

Today, in the interior of North America there is an extensive north-south band of corn, soybean and other crops. Only a little more than a hundred years ago this was the tallgrass prairie on the eastern edge of the great interior grasslands. Only fragments of this ecosystem remain and most of what is left is seriously threatened. Over much of the area it is not clear where the tallgrass prairie was or what it was like. This is particularly true of its occurrence in Saskatchewan.

The tallgrass prairie was a blend zone of woodlands, savanna and glades, home to remarkable, and now greatly diminished, biodiversity.[3,16,19] It may have evolved as a major ecosystem as little as 10,000 years ago,[19, 28] and this recent evolution has been proposed as an explanation for the fact that relatively few species are confined to the tallgrass prairie region. Despite the low endemism in some groups such as ants,[28] a number of endangered endemic or nearly endemic species are well-known. These include the Regal Fritillary butterfly,[5, 29, 30, 32] Greater Prairie-Chicken,[12] Small White Lady's-slipper orchid (*Cypripedium candidum*) [11] and the Prairie White Fringed-Orchid (*Platanthera praeclara*).[10] We estimate that at least 400 native species of vascular plants occur in the Canadian examples, and this represents approximately 10% of the native flora of Canada.

The tallgrass prairie type was formerly maintained by a combination of natural fires and fires started by native people to improve hunting, and by the effects of countless bison,[18] elk and beaver. The natural processes operated together in complex ways. Fires, interrupted by sloughs and river valleys, burned in a broad mosaic pattern, but also created a local mosaic as a result of the patchiness of bison grazing. Smaller grazed patches, 20 to 50 m^2, or larger grazed lawns over 400 m^2 in size, were less likely to burn due to the loss of fuel to grazing. The year after a fire, bison would graze in the burned patches. The result was a landscape of patches that had been burned, unburned and grazed, or ungrazed for varying periods of time and the patches were forever changing.[18] Since the burned and grazed patches were relatively small and distances between them, relatively short, recolonization by insects and other organisms susceptible to fire, but often reliant upon it, occurred from adjacent unburned patches. Before 1800, 30 to 60 million bison may have occupied the plains of western North America and they played a major role in determining the composition of the ecosystem. Much management of prairie by fire has failed to simulate the local fire mosaic and other effects of the interaction between bison and fire.[16]

Today most of the tallgrass prairie region has been converted to farmland and urban development. No major North American ecosystem has been reduced to such an extent. In the absence of fire and grazing, what little uncultivated land was left after conversion of the landscape by European man was subject to succession and soon replaced by woodland. Over much of its previously occupied area, tallgrass prairie is now represented by scattered remnants that amount to less than 1/10th of one percent of the original area.[27] Considering the likely extent of tallgrass prairie and the area of the ecozones within which it was dominant in Ontario, Manitoba and Saskatchewan, [6, 9, 19, 20, 21, 26, 31] we calculate that the Canadian tallgrass prairie may have extended over as much as 10,000 km^2. Based on information from Environment Canada, World Wildlife Fund and other sources, we estimate that less than 1000 hectares is protected.[13,33]

In general, tallgrass prairies are defined as being dominated by the grass, Big Bluestem (*Andropogon gerardii*),[19, 20, 21, 24] but other species of grass including Yellow Indian Grass (*Sorghastrum nutans*), Side-oats Grama (*Bouteloua curtipendula*), Wand Panic Grass (*Panicum virgatum*), Little False Bluestem (*Schizachyrium scoparium*) and Prairie Dropseed (*Sporobolus heterolepis*) are also locally important.[4,19,31] Any of these grasses may dominate a stand or association within the tallgrass prairie region,[19] but Big Bluestem is the signature species. Although stands within tallgrass prairie may be dominated by Little False Bluestem, this species alone is not considered an indicator of tallgrass prairie because it is a frequent, and sometimes dominant, component of the mixedgrass prairies farther west.

The distribution of tallgrass prairie along its western edge has been less well studied than other grassland types [8] and its limits are poorly defined and some of the maps of tallgrass prairie are contradictory. For example, the reference to tallgrass prairie in the description of ecological region 9.2.1 [2, 7] has occasionally led to the inappropriate mapping of tallgrass prairie across Saskatchewan and into Alberta. With a few such exceptions and errors, however, tallgrass prairie has been shown to reach its northwestern limit in Manitoba[25] where it corresponds to ecoregion 162, the Lake Manitoba Plain.[9] Although there is reference to rough fescue grasslands, the description of ecoregion 162 does not (surprisingly) refer to tallgrass prairie which was a dominant community in the zone in pre-settlement times. The classical tallgrass prairie region of Canada is represented in the CEC (Commission for Environmental Cooperation) scheme in the third level as 9.2.2 (48. The Lake Agassiz Plain). Tallgrass prairie was not indicated in Radenbaugh's very useful hierarchical classification of vegetation in Saskatchewan's prairie region.[23]

Big Bluestem has been known for many years from at least 30 sites in southeastern Saskatchewan, [22] and patches of it have been observed along the Souris River, Moose Mountain Creek, Pipestone Creek, Qu'Appelle River and upper Assiniboine River, and north as far as Hudson Bay Junction on the Red Deer River as well as near

Margo and Saltcoats (Jim Romo, Plant Ecologist, pers. comm,. and Vern Harms, Plant Systematist, pers. comm., both at University of Saskatchewan). The vegetation of southeastern Saskatchewan may have been a mosaic of northern mixedgrass prairie, fescue prairie and tallgrass prairie, the latter occurring in patches west to about Whitewood and Yorkton. (Jim Romo, pers. comm.).

Although Big Bluestem has been known for decades from many areas in southeastern Saskatchewan, its potential as an indicator of remnant patches of tallgrass prairie in the province has been less widely realized. This recently changed when Hamilton [14] postulated the presence of more or less continuous tallgrass prairie in parts of southeastern Saskatchewan on the basis of relict populations of host-specific insects that feed on Big Bluestem, Side-Oats Grama and Prairie Dropseed. His results suggest that these patches were not just a result of seeds that had blown in, but that they were relicts of an ecosystem. Hamilton's work suggested that tallgrass prairie extended 400 km northwest of this generally accepted limit. This suggestion has led to a number of questions. How extensive was this tallgrass prairie? Was it an unusual kind of tallgrass prairie? Are there any substantial remnants left? A preliminary investigation was undertaken to begin to answer these questions.

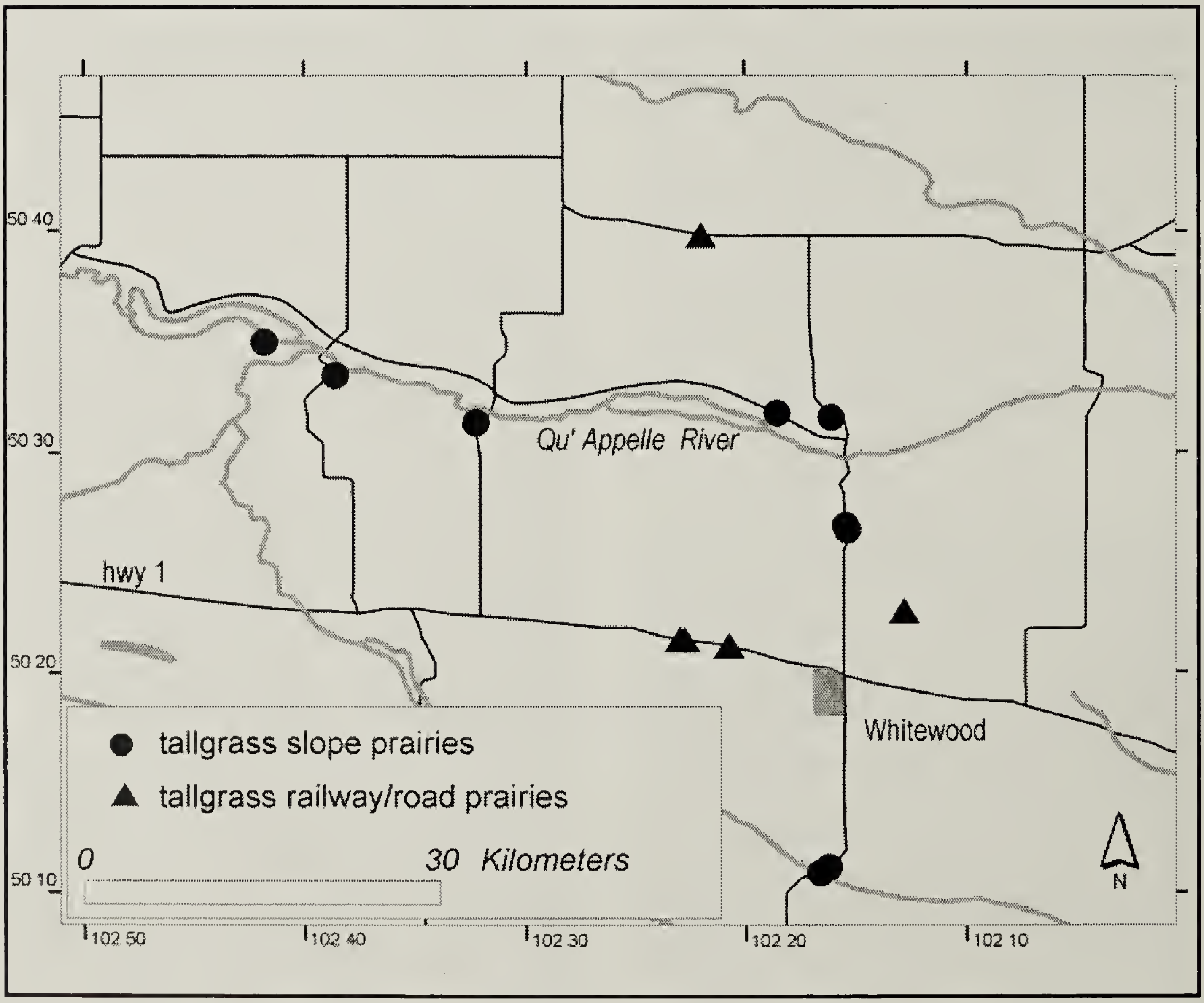

Figure 1. Tallgrass prairie slopes (dots) and prairies on plateaus along railways and roads (triangles) visited in the vicinity of Whitewood, Saskatchewan in June 2005.

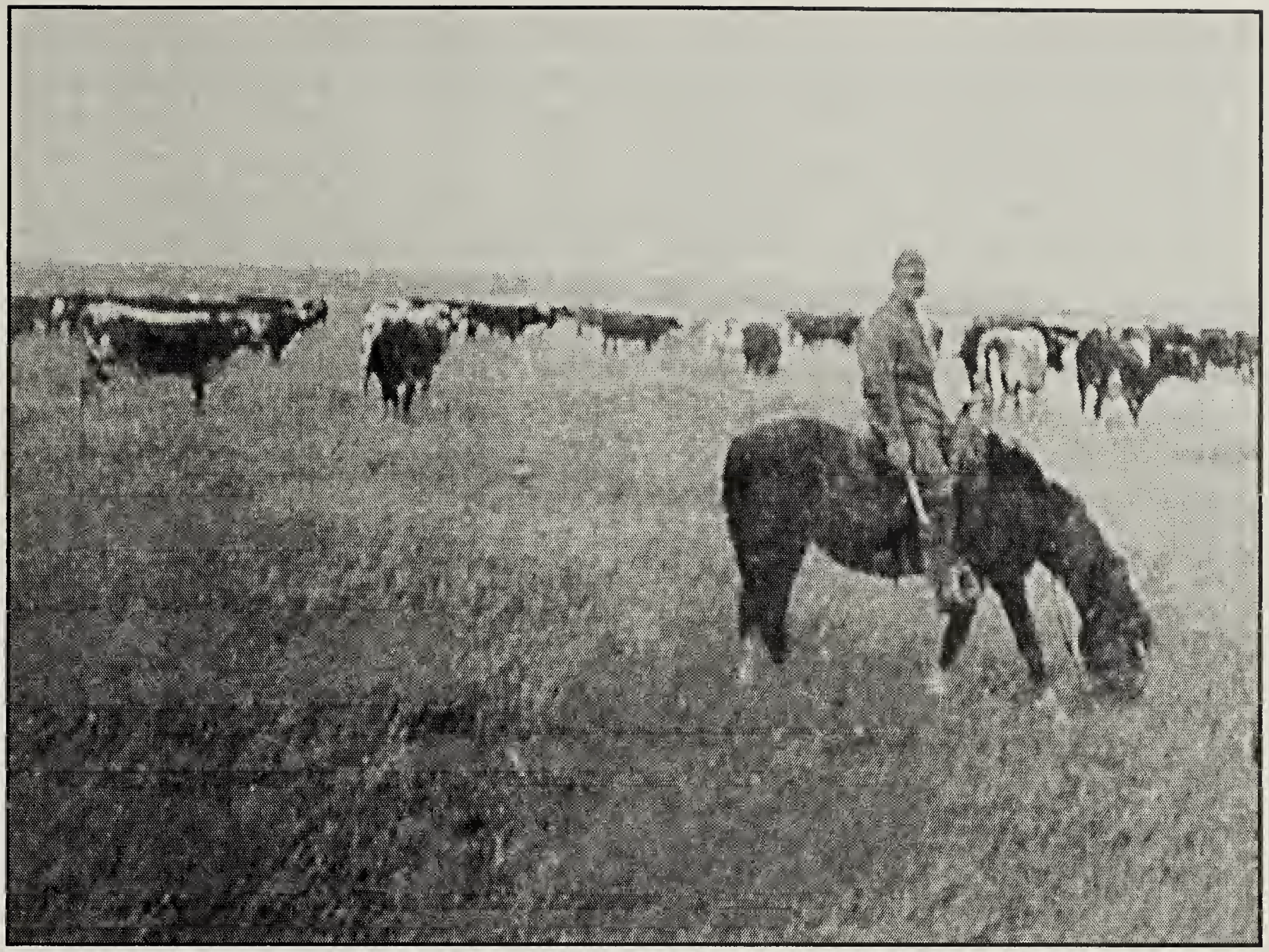

Figure 2. This 1879 photo shows the prairie area south of Whitewood during a cattle drive from Whitewood south to Moose Mountain Creek. Photo provided by George Chopping of Whitewood.

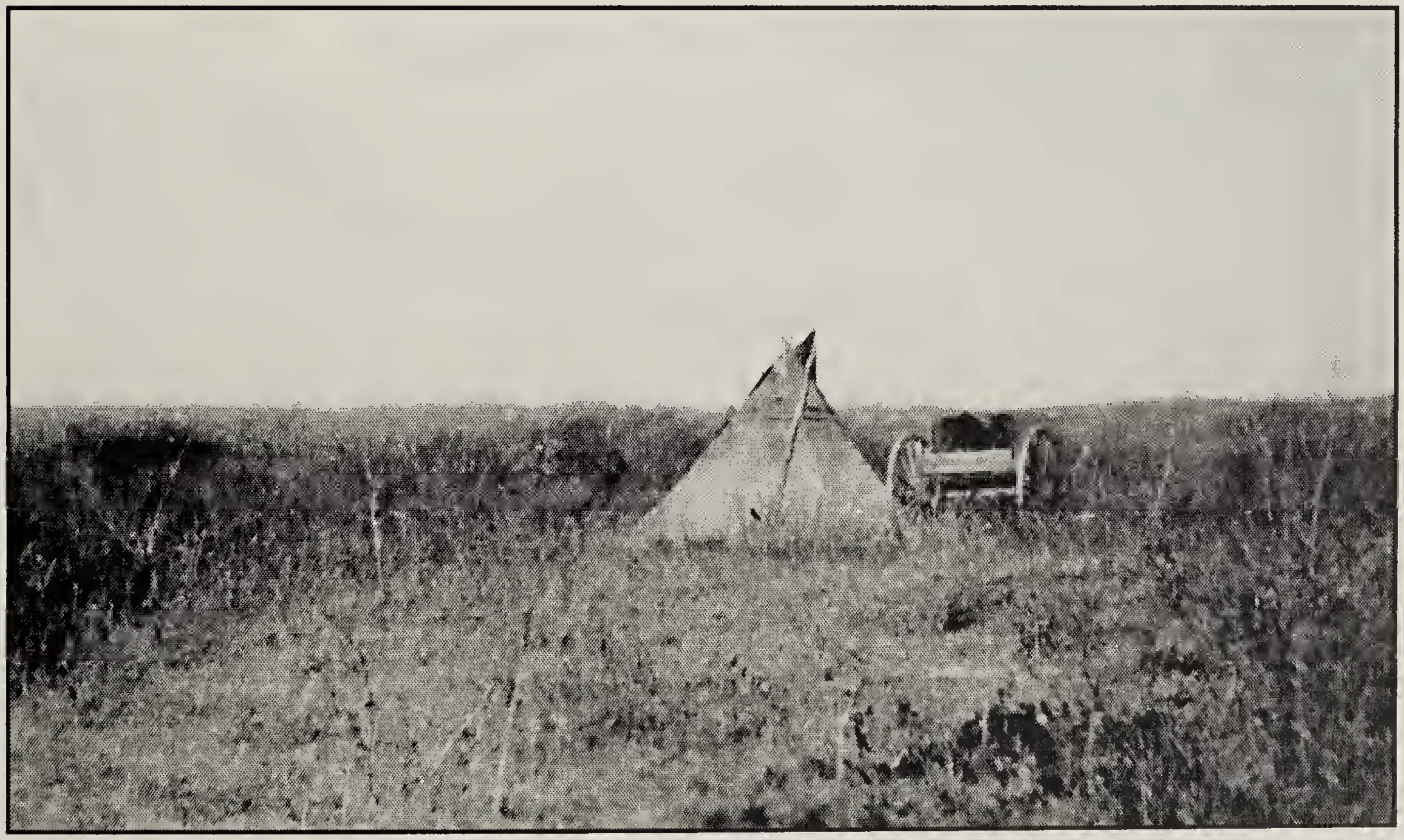

Figure 3. Another 1879 photo from an old album had written below it: "The Indians generally pitched their teepees on the prairie about ½ mile north of Whitewood." Photo provided by George Chopping of Whitewood.

Methods

A survey of tallgrass prairie remnants in the area around Whitewood, a town approximately 65 km west of the Manitoba border on Hwy 1 (Figure 1), was undertaken from June 6 - 15, 2005. We located tallgrass prairie by locating patches of the signature species, Big Bluestem, which was evident as dead stems of the previous year. Three searching strategies were employed to find patches: (1) driving a variety of roads, (2) walking and driving along railways, (3) finding, with the help of local farmers, land that was unbroken. The common and scientific names used in this article were derived from Kartesz and Meachum.[17]

Historical Perspectives

In the late 1800s, prairie occurred throughout the region of Whitewood. Photos from this period show that the grass is relatively short (Figure 2). Mature stands of trees were scarce and Aspen Poplar (*Populus tremuloides*) stands were maintained as scrub or saplings by the frequent fires (Figure 3). Whitewood was named for a unique stand of Birch (*Betula papyrifera*) or Aspen Poplar (both of which can have white trunks). Early settlers travelled from Regina to Moose Mountain, south of Whitewood, to get firewood for the winter, often enduring incredible hardship. The days of this fire-maintained ecosystem were numbered. By the early 1900s much of the land had been converted to fields of crops and pasturelands often "improved" with introduced European grasses.[1] The landscape today is mostly croplands with scattered sloughs and trees and frequent groves

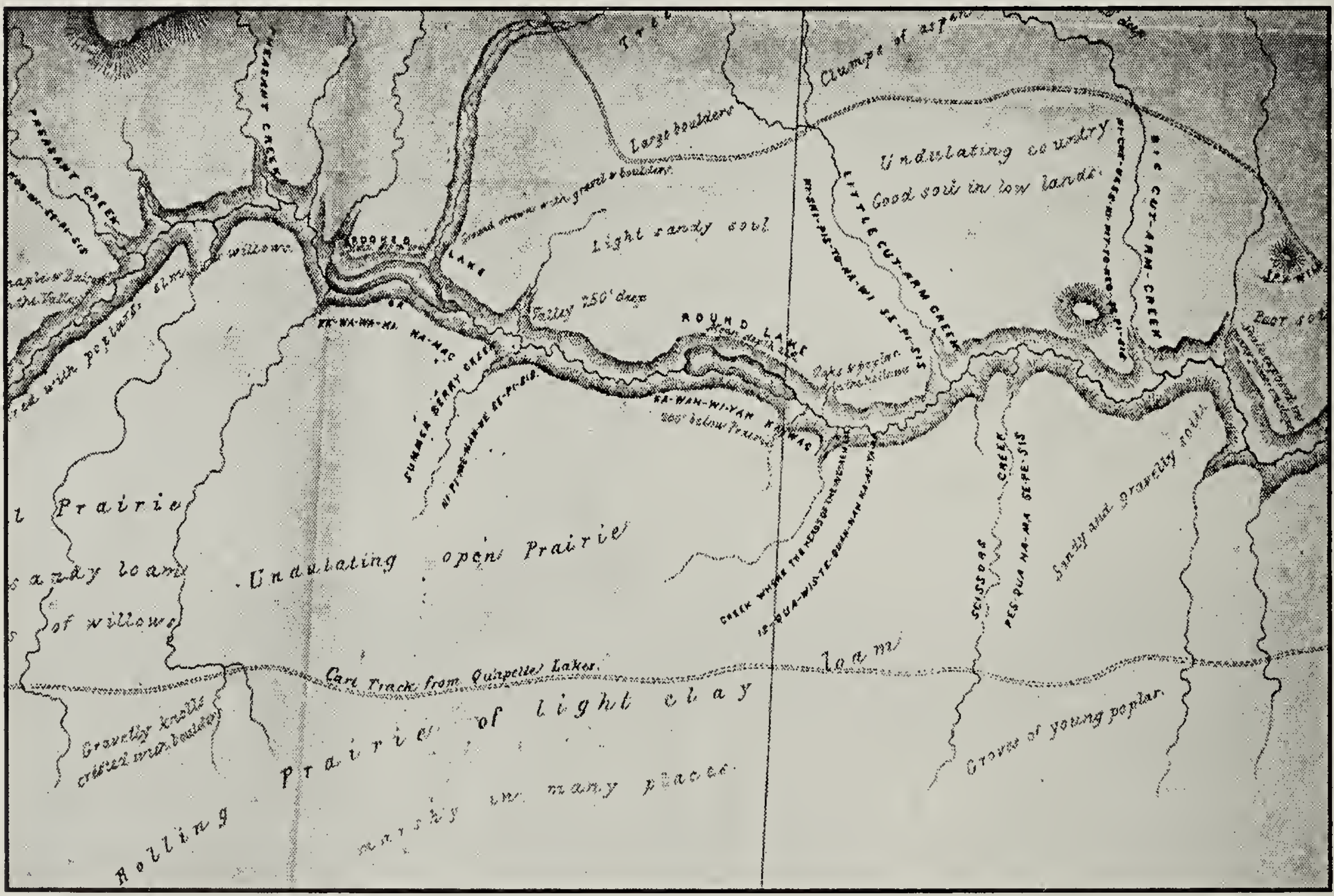

Figure 4. In this portion of Henry Youle Hind's 1858 map much of the area around Whitewood (then part of Rupert's Land) is clearly identified as prairie. Whitewood is on the cart track near the word "loam" to the right of and below centre. Provided by Blaine Coleman. Source: Hind, H. Y. 1859. Territoire du Nord-Ouest, John Lovell, Toronto.

of Aspen Poplar. Although confirmed to be predominant in pre-settlement times (Figure 4), it is hard to imagine prairie in this area today.

Field Survey Results

We soon learned that Big Bluestem was most likely to be found along river valleys, but a few small patches were also located along the railways and roadsides on the rolling prairie plateau (Figure 1). In all cases these essentially flat railway and roadside patches were near or under Aspen Poplars. All were very small, being less than 0.1 acre, and most were developing into woodland. Along the roads and railways, relicts of both fescue prairie and mixedgrass prairie dominated by Little Bluestem were much more abundant and the unbroken lands were either dominated by introduced species or by impressive mixedgrass associations. The few tallgrass prairie patches were rich in native species and appeared to be authentic remnants that were very much like the main northern portion of continuous tallgrass prairie. Obvious early summer plants in these remnants included several species with yellow flowers such as Hoary Pucoon (*Lithospermum canescens*, Figure 5), Heart-leaf Alexanders (*Zizia aptera*) and Yellow Lady's-slipper (*Cypripedium parviflorum* var. *pubescens*). The yellow color of their flowers may be an advantage in sharing pollinators. A few white-flowered species were also frequent, including Cream Vetchling (*Lathyrus ochroleucus*) and Canadian White Violet (*Viola canadensis* var. *rugulosa*). Gray Willows (*Salix bebbiana*) were present at a number of the locations, suggesting mesic conditions.

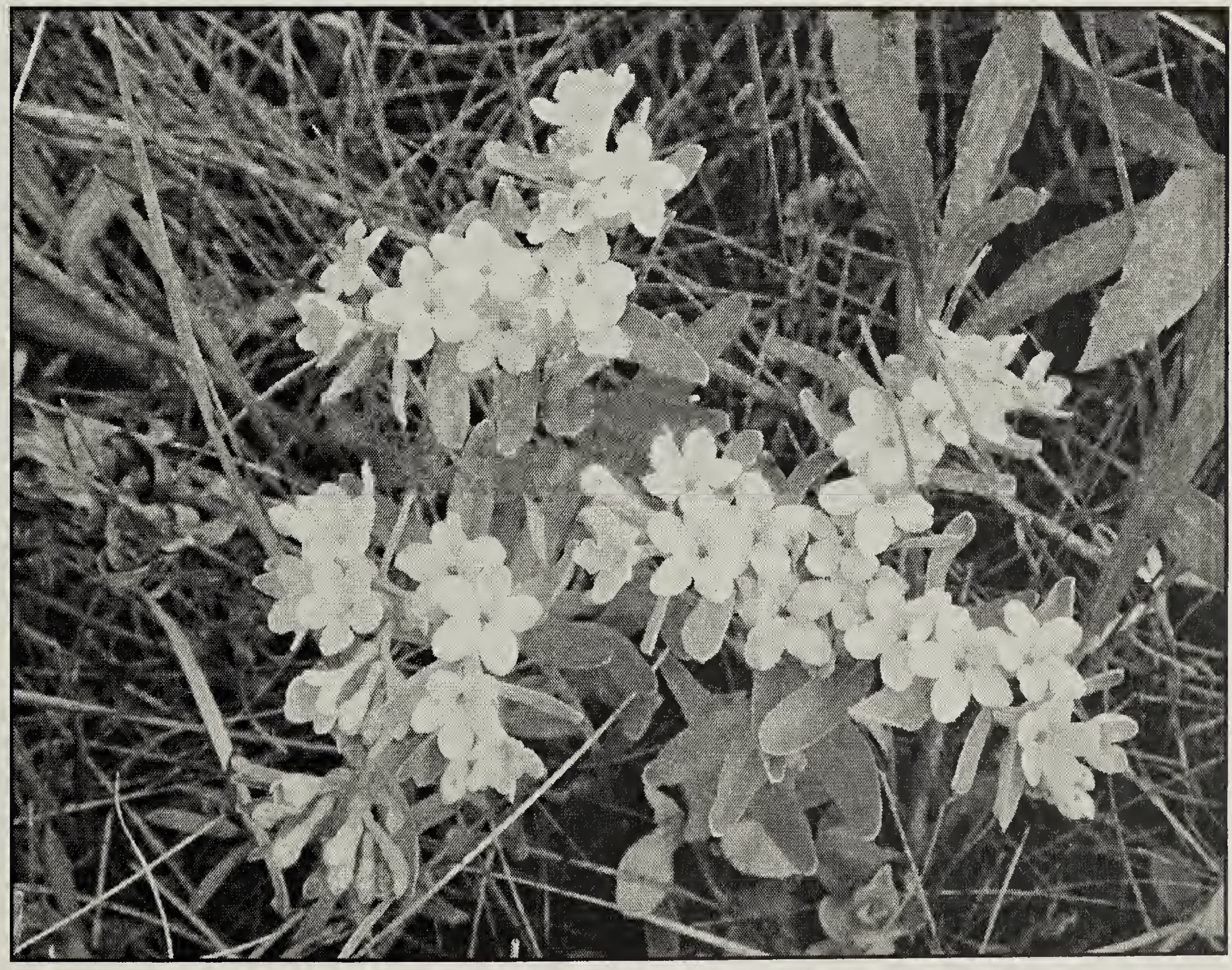

Figure 5. Hoary Pucoon west of Whitewood, June 2005. *P.M. Catling*

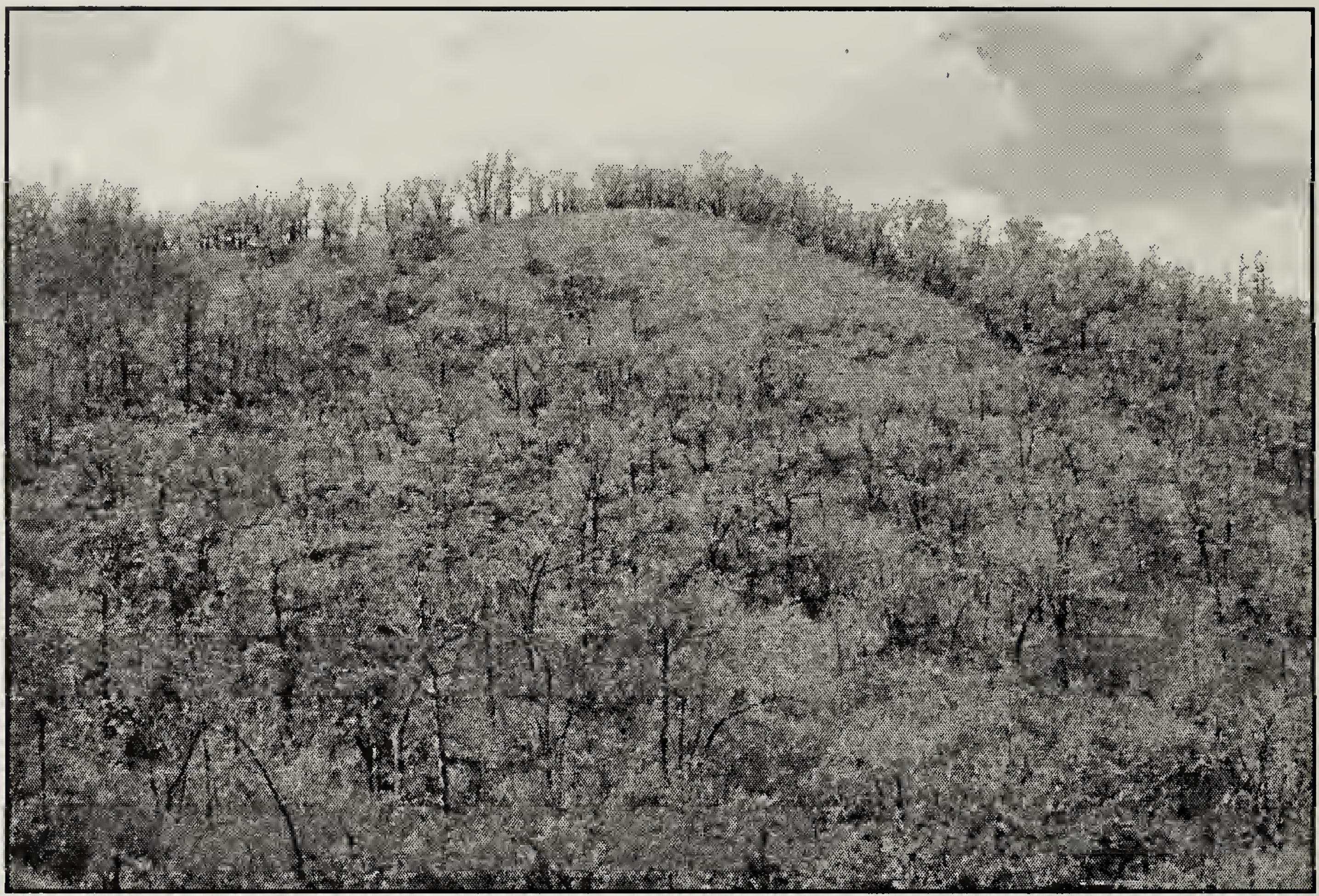

*Figure 6. Tallgrass prairie (open area in upper middle) on a south-facing slope of a creek draining into the Qu'Appelle River north of Whitewood, June 2005. In pre-settlement times, the tallgrass prairie would probably have been predominant in this area which has more recently closed in with Bur Oak (*Quercus macrocarpa *Michx.) woodland and savanna.* *P.M. Catling*

The composition of tallgrass prairie on river valley slopes differed from that on plateaus. On the larger slope sites (0.5 to 2 acres, Figures 6, 7) the species noted above tended to be less frequent and more or less confined to the lower levels. Higher on the slope, conditions become drier and other graminoids increased in frequency including some typical of drier prairie such as Blue Grama or Eyebrow Grass (*Bouteloua gracilis*), porcupine grasses (*Hesperostipa* spp.) and Thread-Leaf Sedge (*Carex filifolia*). Over much of the area where tallgrass prairie remnants exist, it was unusual to see these species growing beside Big Bluestem. Many of the distinctive herbaceous species present were also characteristic of the drier mixedgrass prairie farther west. Among the spring flowering herbs of the tallgrass prairie slope sites were: White Wild Onion (*Allium textile*), Red Windflower (*Anemone multifida*), Holboell's Rockcress (*Arabis holboellii* var. *secunda*), Oval-Leaf Milkweed (*Asclepias ovalifolia*), Green Comet Milkweed (*Asclepias viridiflora*), Cock's-Head (*Astragalus agrestis*), Two-Groove Milk-Vetch (*Astragalus bisulcatus* var. *bisulcatus*), Laxmann's Milk-Vetch (*Astragalus laxmanii* var. *robustior*), Missouri Milk-Vetch (*Astragalus missouriensis*), Loose-flower Milk-Vetch (*Astragalus tenellus*), Great Plains Indian Paintbrush (*Castilleja sessiliflora*, see front cover photograph), Early Yellow Locoweed (*Oxytropis sericea* var. *speciosa*), Large Indian-Breadroot (*Pediomelum esculentum*, Figure 8), Lamb-tongue Ragwort (*Senecio integerrimus*), Red-Line Beardtongue (*Penstemon*

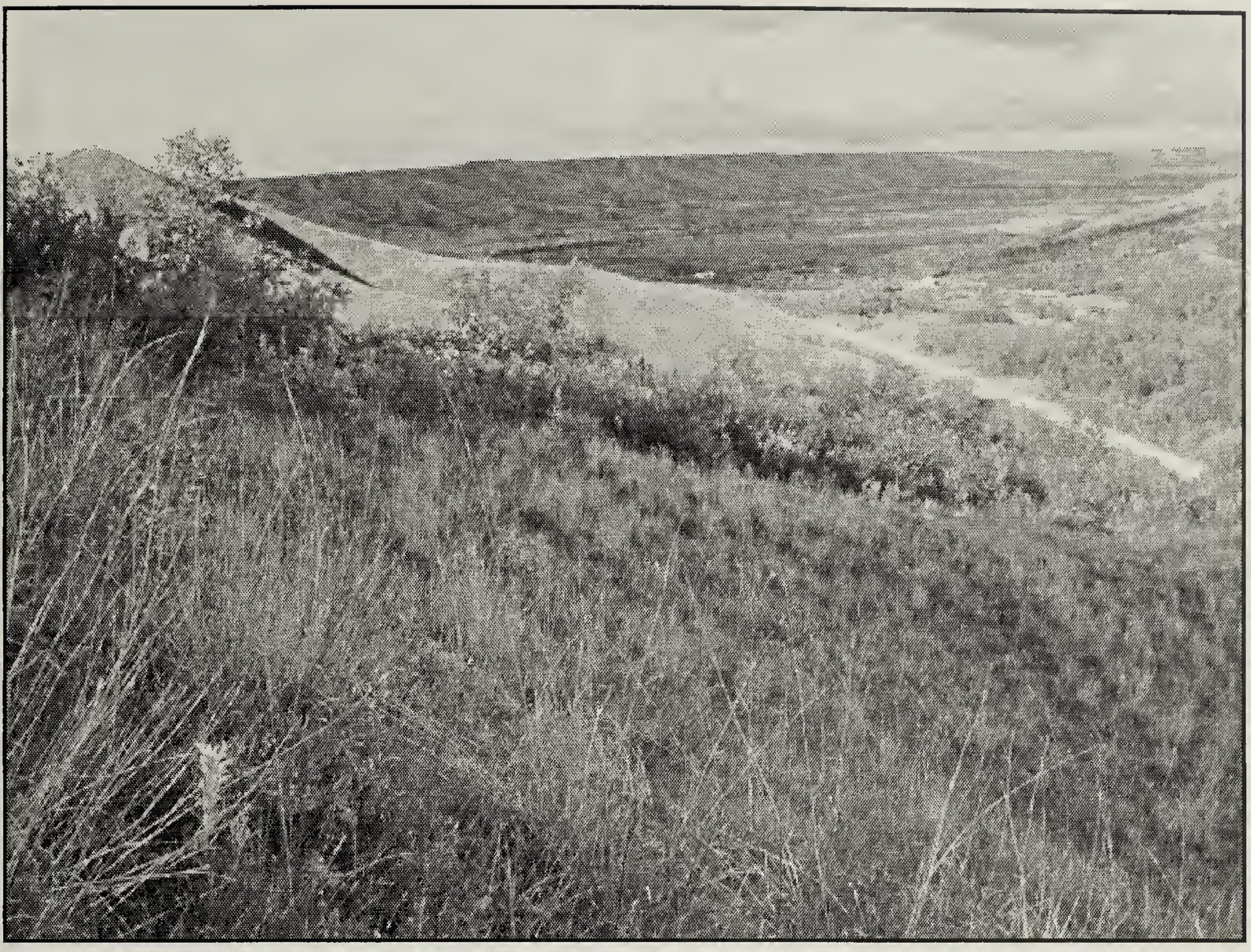

Figure 7. Tallgrass prairie in the foreground on an upper east-facing slope in the Kahkewistahaw Hills on the south side of the Qu'Appelle Valley. The old stems and clumps of Big Bluestem from the previous year are obvious and a plant of Great Plains Indian Paintbrush is evident in the lower left. *P.M. Catling*

albidus), and American Pasqueflower or Prairie Crocus (*Pulsatilla patens* ssp. *multifida*). Based on this composition, the slope sites appear to be a distinctive intergrading type of tallgrass prairie.

At the top of the slopes, the tallgrass prairie was replaced by either a band of Northern Bedstraw (*Galium boreale*) and thickets of Saskatoon (*Amelanchier alnifolia*), or by Fescue prairie and Aspen Parkland with glades dominated by Hall's Fescue (*Festuca hallii*) and groves of Aspen-Poplar.

Other frequent spring- and early summer-blooming plants in both types of tallgrass prairie are Bastard-Toadflax (*Comandra umbellata* ssp. *umbellata*), Rough Fleabane (*Erigeron asper*), American Licorice (*Glycyrrhiza lepidota*) and Boreal Sweet-Vetch (*Hedysarum boreale* ssp. *boreale*). These are all common, wide-ranging species of northern grasslands, Aspen Parkland, and vegetation zones transitional to the southern boreal forest.

A number of plant species that are rare in Saskatchewan [15, 22] are associated with the tallgrass prairie remnants that we have seen, either in the region of Whitewood or along the Souris River. Examples include forbs such as Eastern Yellow Star-grass (*Hypoxis hirsuta*, Figure 9), Stemless Locoweed (*Oxytropis lambertii*), Closed Bottle Gentian (*Gentiana*

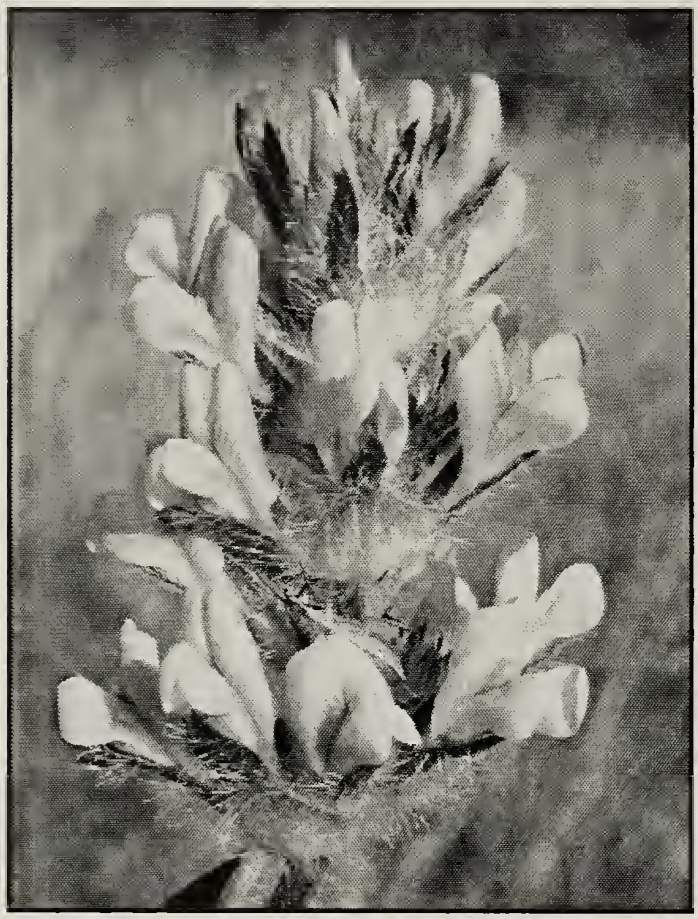

Figure 8. Inflorescence of Large Indian-Breadroot in the Qu'Appelle valley, June 2005. The roots of this plant are edible (cooked or raw) and it is one of several native plants on the prairie with some economic potential. *P.M. Catling*

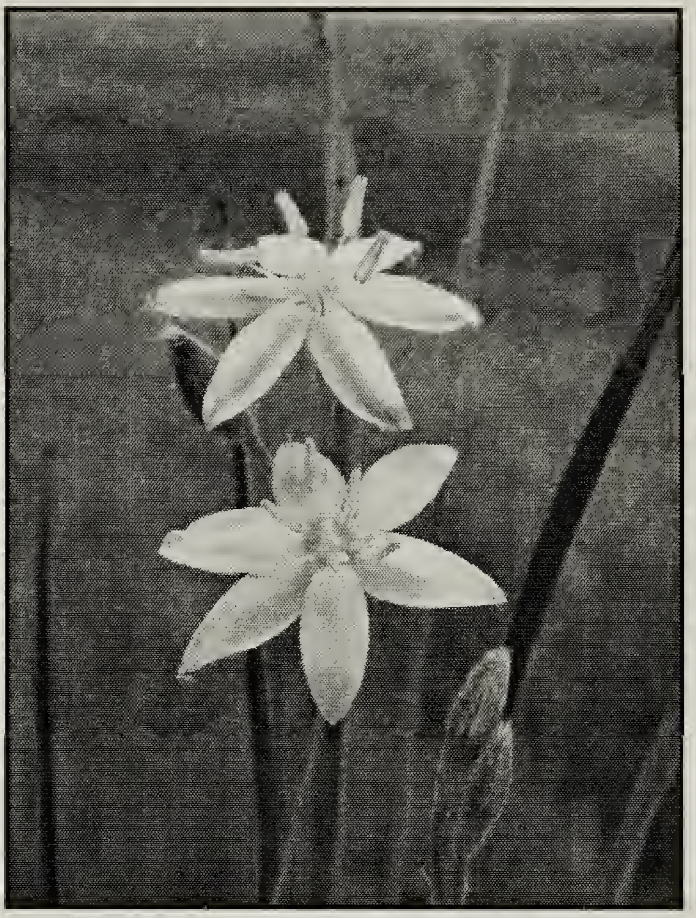

Figure 9. Eastern Yellow Star-grass, (north of Whitewood, June 2005) a rare plant in Saskatchewan and a characteristic species of the tallgrass prairie region. *P.M. Catling*

andrewsii var. *dakotica*), Whorled Milkweed (*Asclepias verticillata*), and Whorled Milkwort (*Polygala verticillata* var. *isocycla*), and grasses, including the characteristic Big Bluestem (*Andropogon gerardii*), Side-oats Grama (*Bouteloua curtipendula*), Yellow Indian Grass (*Sorghastrum nutans*) and Wand Panic Grass (*Panicum virgatum*).

Discussion

The tallgrass prairie, characteristic of moister sites, would be the first kind of prairie to be replaced by trees after cessation of fire. Nevertheless the high frequency of mixedgrass prairie in the surviving remnants suggests that at the time of settlement it was this kind of prairie that predominated on the rolling plateau between the river valleys with tallgrass prairie in isolated and infrequent patches. In the region of Whitewood, and likely elsewhere in southeastern Saskatchewan, tallgrass prairie was probably most frequent along the slopes of larger river valleys (Figure 10). The slope sites appear to be a distinctive intergrading type of tallgrass prairie with a relatively high diversity associated with the moisture gradient. The plant association includes many species that are characteristic of the drier mixedgrass prairie farther west. A transition upslope from mesic tallgrass prairie to drier tallgrass prairie to mixedgrass prairie with Aspen Poplar parkland and Fescue prairie on top of the slope is probably a result of a moisture gradient. Water availalability would be less on the upper slope than on the top or on the

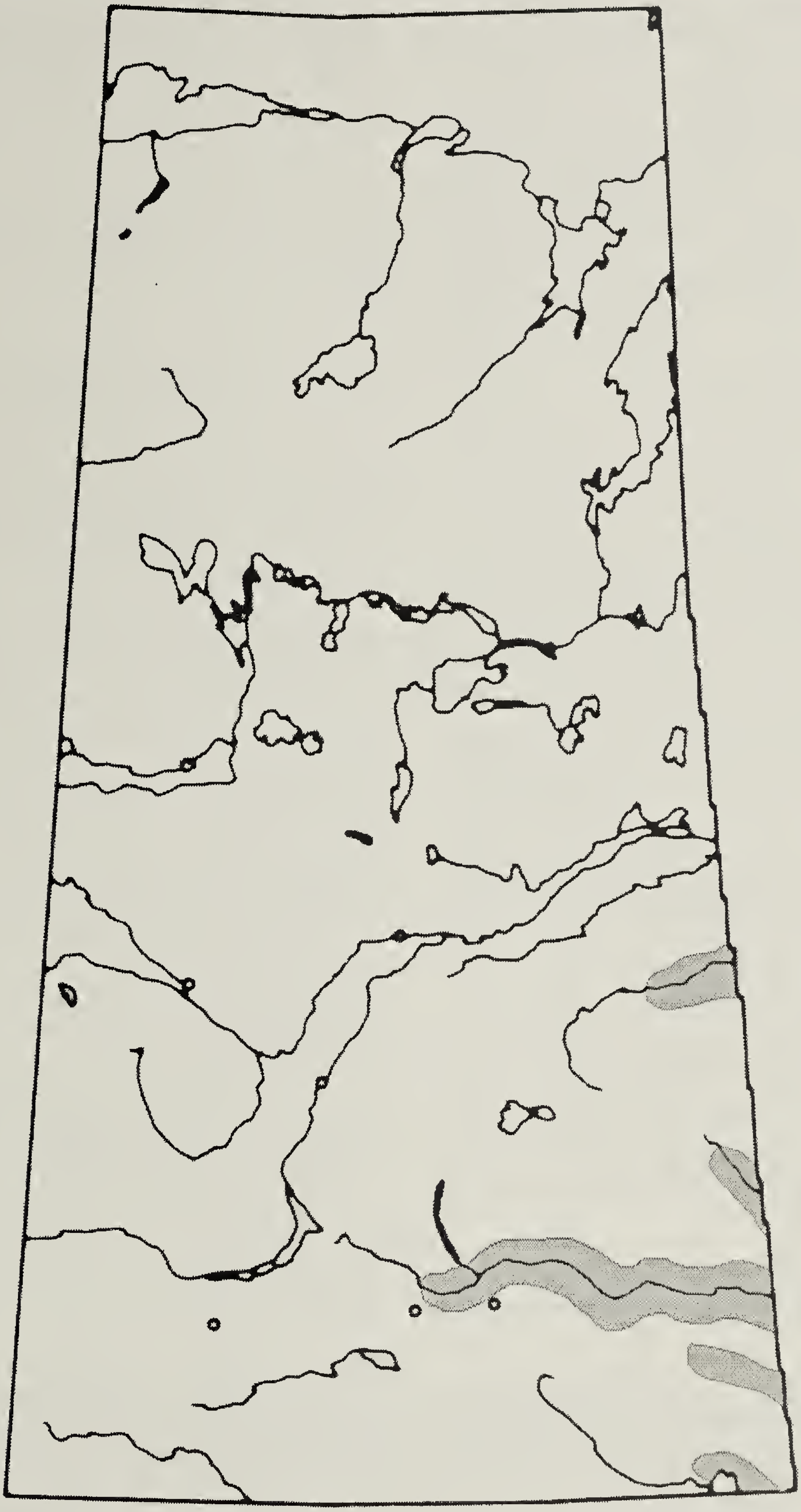

Figure 10. Map of Saskatchewan, showing the likely distribution of more or less continuous tallgrass prairie (shaded areas along rivers in the southeast) in pre-settlement times. The map is based on the distribution of Big Bluestem[22], tallgrass prairie associated insects[14] and field survey. Within the shaded region tallgrass prairie may have been more or less continuous but probably occupied much less than 10% of the shaded areas. There may also have been scattered, isolated occurrences of tallgrass prairie near to these shaded areas.

lower slope. The tallgrass prairie was probably once much more extensive downslope and existed where there are now extensive slope forests. These tallgrass prairie sites also contain a number of plant species that are rare in Saskatchewan and more study is required to understand and protect their biodiversity.

Acknowledgements

Vern Harms and Jim Romo of the University of Saskatchewan and Bill Cody of Agriculture and Agri-Food Canada, and an anonymous reviewer made valuable comments. Blaine Coleman and George Chopping of Whitewood contributed historical materials and assisted with finding prairie sites. Anna Leighton provided a very helpful review of the manuscript.

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> "Cocoa bushes bloom twice a year, and their pollination depends on biting midges (*Ceratopongonidae*) and gall midges (*Cecidomyiidae*). Despite a domestication process that began with the Aztecs thousands of years ago, most cocoa bushes still require the services of their wild pollinators....Compost and rotting banana stems must be strewn between the cocoa bushes to provide midge mommies with maggot nurseries. Moldy fallen fruit are left on the ground, as adult gall midges like to eat fungus spores."

- Peter Bernhardt
The Rose's Kiss: A Natural History of Flowers, p.144-145.

FLIES: NUISANCE OR NECESSITY?

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R3B 0N2

Introduction

Few people would disagree that flies are a nuisance. While houseflies and fruit flies are usually just annoying, the biting flies, namely horse, deer and black flies, can inflict painful, itchy bites. Naturalists are less disdainful of flies than other people because they know flies are food for bats, birds and dragonflies. But flies are more than just fodder for hungry animals, they also pollinate plants.[5]

Flies are in the order Diptera along with mosquitoes and gnats. The word 'diptera' means "two wings" in Latin. The forewings of flies are large and membranous while the hindwings are reduced to tiny bumps called halteres. The reduction of the hindwings gives the flies more maneuverability.[1] Tiny claws and sticky pads on the legs of flies enable them to grip any surface, even while they are upside down.[1] Their mouthparts are adapted for sucking or lapping up liquids, such as flower nectar.

To determine the potential importance of flies in the pollination of native plants, two study sites were sampled for flower visitor diversity during the summer of 2004: the Living

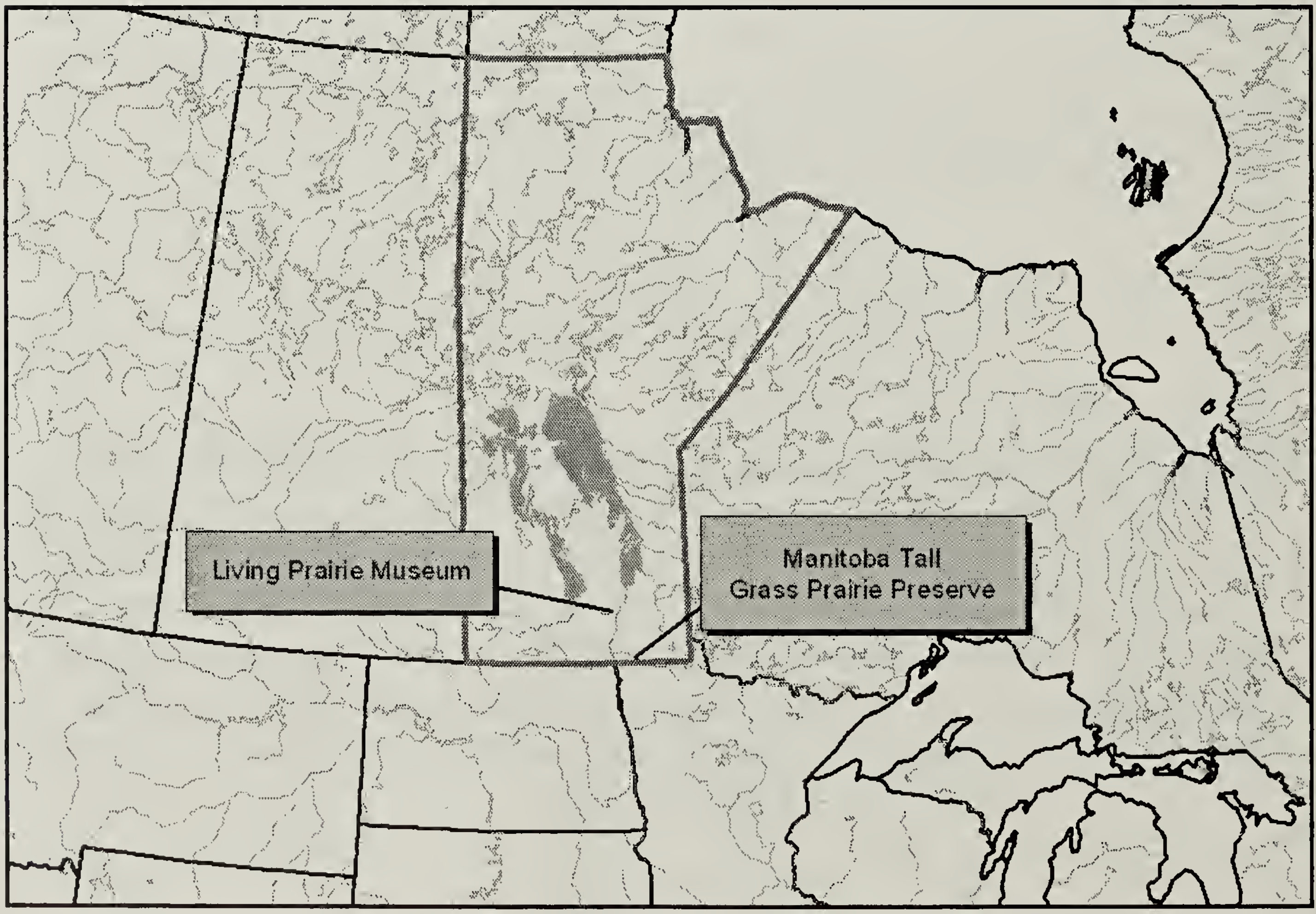


Figure 1. Location of study sites in Manitoba

Prairie Museum (LPM) in Winnipeg, MB and the Tall Grass Prairie Preserve (TGPP) near Vita, MB (Fig. 1). The LPM is a 12-ha remnant of tallgrass prairie, completely surrounded by urban development. The TGPP is a considerably larger (2000-ha), more contiguous preserve. Both sites are in the Lake Manitoba Plain ecoregion and have a similar climate, although drainage is poorer at the TGPP.

Methodology

At each site, six 5 m x 5 m plots were established. Sampling was done every two weeks, from the second week of June to the third week of September. The number of flowers each adult insect species visited in each plot was recorded. Each plot was surveyed for 60 minutes every sampling week. Since foraging activity is low in the early morning and late afternoon, surveys were typically conducted between 12 pm and 5 pm. The visitation sequence was randomized to correct for differences in insect visits during the course of the day. Regardless of whether insects were foraging for pollen or nectar, all were considered potential pollinators. At least one specimen of each insect species was captured, placed in a killing jar with ethyl acetate and frozen for later identification by Heather White (J.B. Wallis Museum, University of Manitoba). Voucher specimens for each plant species visited by an insect were collected from outside the sample plots. The plant and insect specimens were digitally photographed, and the images and specimens deposited in The Manitoba Museum.

Results

At least 60 species of insects representing four orders were observed feeding on nectar from (and possibly pollinating) 39 plant species (Table 1). Just over half of the insect species observed were in the order Diptera. Dipterans were responsible for 64% of all floral visits (Fig. 2). The most important dipteran family was the Syrphidae (hover flies) (Fig. 3). Syrphids were responsible for 72% of all dipteran flower visits. One species in particular, *Toxomerus marginatus*, was observed feeding on the nectar of 22 different plant species throughout the summer. However, the efficacy of *T. marginatus* in pollinating those species may be low due to its small body size and lack of abundant hairs where pollen can attach. The Scatopsidae (scavenger flies) and Muscidae (house flies) were the next most common flower-visiting dipteran families. Dipterans in 12 other families, including the Culicidae or mosquito family, accounted for about 11% of the visits.

Hymenoptera (bees and wasps) were second in terms of species abundance and floral visits, outperforming the Lepidoptera (butterflies and moths). Of the hymenopteran families, the family Apidae (bumblebees) was the most active (Fig. 4) followed by the Andrenidae (mining bees) and Halictidae (sweat bees). Hymenoptera in five other families accounted for only 3% of the visits. Insects in the dipteran and hymenopteran orders visited a similar number of plant species: 28 and 27 species respectively (Fig. 5).

Discussion

Many groups of insects are anthophilous, making use of flowers as resting and hunting sites, or as a source of nectar and pollen. A subset of these flower visitors are pollinators, transferring the pollen from the anthers of one flower to the stigma of another. The efficacy of a pollinator depends on

Table 1. Insect species observed during the study and the plant species they visited.

Order:	Family:	Name:	Achillea millefolium	Agoseris glauca	Allium stellatum	Asclepias ovalifolia	Aster ciliolatus	Aster ericoides	Astragalus agrestis	Campanula rotundifolia	Cirsium flodmanii	Comandra umbellata	Dalea purpurea	Erigeron asper	Erigeron glabellus	Fragaria virginiana	Gaillardia aristata	Galium boreale	Helianthus maximilianii	Hypoxis hirsuta	Liatris ligulistylis	Total
COLEOPTERA	Chrysomelidae	*Orsodachne atra*																1				1
	Cleridae	*Hydrobaenus* sp.																1				1
		Trichodes nutalli												1								1
	Meloidae	*Epicauta pennsylvanica*																				0
	Phalacridae	*Olibrus* sp.																				0
DIPTERA	Anthomyiidae	*Crinurina* sp. #1																			1	1
		Crinurina sp. #2																				0
	Bombyliidae	*Poecilanthrax tegminipennis*																	1			1
	Calliphoridae	*Pollenia rudus*																1				1
	Chloropidae	Chloropidae sp. #1										1		1								2
		Chloropidae sp. #2																				0
	Conopidae	*Zodion fulvifrons*																				0
	Culicidae	*Aedes nigripes*																				0
	Ephydridae	*Lamproscatella* sp.																				0
		Scatella sp.								1												1
	Muscidae	*Stomoxys calcitrans*																				0
		Haematobosca alcis					1														1	2
	Otitidae	Otitae sp. #1																				0
	Sarcophagidae	Sarcophagidae sp.						1														1
	Scatopsidae	*Psectrosciara* sp.					1															1
	Sciaridae	*Eugnoriste* sp.												1								1
	Stratiomyidae	*Odontomyia pubescens*																				0
		Odontomyia virgo	1																			1
	Syrphidae	*Cheilosia* sp.												1								1
		Eristalis sp. #1																	1			1
		Eristalis sp. #2					1	1														2
		Helophilus sp. #1					1	1														2
		Helophilus sp. #2																			1	1
		Syrphus ribesii			1																	1
		Syrphus sp. ?					1	1														2
		Toxomerus marginatus	1				1	1		1			1	1		1		1	1			9
	Tachinidae	*Cylindromyia interrupta*																				0
		Tachina sp.					1															1
		Tachinidae sp.																				0

Table 1, continued

Order:	Family:	Name:	Achillea millefolium	Agoseris glauca	Allium stellatum	Asclepias ovalifolia	Aster ciliolatus	Aster ericoides	Astragalus agrestis	Campanula rotundifolia	Cirsium flodmanii	Comandra umbellata	Dalea purpurea	Erigeron asper	Erigeron glabellus	Fragaria virginiana	Gaillardia aristata	Galium boreale	Helianthus maximilianii	Hypoxis hirsuta	Liatris ligulistylis	Total
HYMENOPTERA	Andrenidae	*Andrena* sp.																1				1
		Andrenidae sp. #1					1															1
		Andrenidae sp. #2												1								1
	Anthophoridae	*Epeolus* sp.													1				1			2
	Apidae	*Apis mellifera*																				0
		Bombus perplexus					1		1													2
		Bombus ternarius					1	1					1								1	4
		Bombus vagans									1		1								1	3
	Braconidae	Braconidae sp.																				0
	Colletidae	*Hylaeus* sp.																1				1
	Formicidae	*Dolichoderus plagiatus*				1																1
		Myrmicinae sp. #1				1						1						1				3
		Myrmicinae sp. #2																1				1
	Halictidae	*Augochlora* sp.		1			1					1	1	1						1		6
		Dialectus sp. #1					1	1		1				1	1	1		1				7
		Halictidae sp. #1								1				1								2
		Halictidae sp. #2		1																		1
		Halictidae sp. #3																				0
		Halictidae sp. #4																	1			1
		Halictus rubicundis		1																		1
	Tenthredinidae	*Dolerus* sp.																				0
LEPIDOPTERA	?	Undetermined												1				1				2
	Noctuidae	*Euxoa divergens*									1											1
	Nymphalidae	*Papilio polyxenes*			1																	1
	Pieridae	*Colias philodice*															1					1
	Satyridae	*Coenonympha tullia*																1				1

Table 1, continued

Order:	Family:	Name:	*Lobelia spicata*	*Monarda fistulosa*	*Pediomylum argophyllum*	*Pentaphylla floribunda*	*Rosa arkansana*	*Rudbeckia hirta*	*Senecio plattensis*	*Sisyrinchium montanum*	*Solidago canadensis*	*Solidago graminifolia*	*Solidago nemoralis*	*Solidago ptarmicoides*	*Solidago rigida*	*Symphoricarpos occidentalis*	*Viola nephrophylla*	*Zizia aptera*	*Zizia aurea*	*Zygadenus elegans*	Total
COLEOPTERA	Chrysomelidae	*Orsodachne atra*																			0
	Cleridae	*Hydrobaenus* sp.																			0
		Trichodes nutalli																			0
	Meloidae	*Epicauta pensylvanica*										1									1
	Phalacridae	*Olibrus* sp.												1	1						2
DIPTERA	Anthomyiidae	*Crinurina* sp. #1						1			1			1	1				1	1	6
		Crinurina sp. #2																1			1
	Bombyliidae	*Poecilanthrax tegminipennis*									1				1						2
	Calliphoridae	*Pollenia rudus*																			0
	Chloropidae	Chloropidae sp. #1																1			1
		Chloropidae sp. #2																1			1
	Conopidae	*Zodion fulvifrons*						1													1
	Culicidae	*Aedes nigripes*									1		1								2
	Ephydridae	*Lamproscatella* sp.																1			1
		Scatella sp.																1			1
	Muscidae	*Stomoxys calcitrans*									1		1								2
		Haematobosca alcis									1				1						2
	Otitidae	Otitae sp. #1				1		1							1				1	1	5
	Sarcophagidae	Sarcophagidae sp.																			0
	Scatopsidae	*Psectrosciara* sp.									1		1	1	1						4
	Sciaridae	*Eugnoriste* sp.										1		1							2
	Stratiomyidae	*Odontomyia pubescens*														1		1			2
		Odontomyia virgo	1											1		1				1	4
	Syrphidae	*Cheilosia* sp.																			0
		Eristalis sp. #1												1							1
		Eristalis sp. #2									1	1			1						3
		Helophilus sp. #1									1	1	1		1						4
		Helophilus sp. #2																			0
		Syrphus ribesii									1	1				1					3
		Syrphus sp. ?				1		1			1	1		1	1						6
		Toxomerus marginatus				1	1	1	1	1	1	1	1	1	1	1	1	1	1		14
	Tachinidae	*Cylindromyia interrupta*							1									1	1		3

Table 1, continued

Order:	Family:	Name:	*Lobelia spicata*	*Monarda fistulosa*	*Pediomylum argophyllum*	*Pentaphylla floribunda*	*Rosa arkansana*	*Rudbeckia hirta*	*Senecio plattensis*	*Sisyrinchium montanum*	*Solidago canadensis*	*Solidago graminifolia*	*Solidago nemoralis*	*Solidago ptarmicoides*	*Solidago rigida*	*Symphoricarpos occidentalis*	*Viola nephrophylla*	*Zizia aptera*	*Zizia aurea*	*Zygadenus elegans*	Total
DIPTERA		*Tachina* sp.													1						1
		Tachinidae sp.													1						1
HYMENOPTERA	Andrenidae	*Andrena* sp.					1				1				1	1					4
		Andrenidae sp. #1													1	1				1	3
		Andrenidae sp. #2														1					1
	Anthophoridae	*Epeolus* sp.													1						1
	Apidae	*Apis mellifera*									1										1
		Bombus perplexus		1							1				1						3
		Bombus ternarius		1	1		1				1	1			1	1					7
		Bombus vagans									1					1					2
	Braconidae	Braconidae sp.																	1		1
	Colletidae	*Hylaeus* sp.																			0
	Formicidae	*Dolichoderus plagiatus*																			0
		Myrmicinae sp. #1					1				1								1		3
		Myrmicinae sp. #2																			0
	Halictidae	*Augochlora* sp.								1				1	1			1	1		5
		Dialectus sp. #1	1			1				1	1	1	1	1	1	1				1	10
		Halictidae sp. #1						1	1						1				1		4
		Halictidae sp. #2								1									1		2
		Halictidae sp. #3																	1		1
		Halictidae sp. #4														1					1
		Halictus rubicundis																1	1		2
	Tenthredinidae	*Dolerus* sp.																		1	1
LEPIDOPTERA	?	Undetermined						1	1												2
	Noctuidae	*Euxoa divergens*														1					1
	Nymphalidae	*Papilio polyxenes*																			0
	Pieridae	*Colias philodice*																			0
	Satyridae	*Coenonympha inornata*																			0

Figure 2. Insect visits observed at two tallgrass prairie preserves in Manitoba (n=7519)

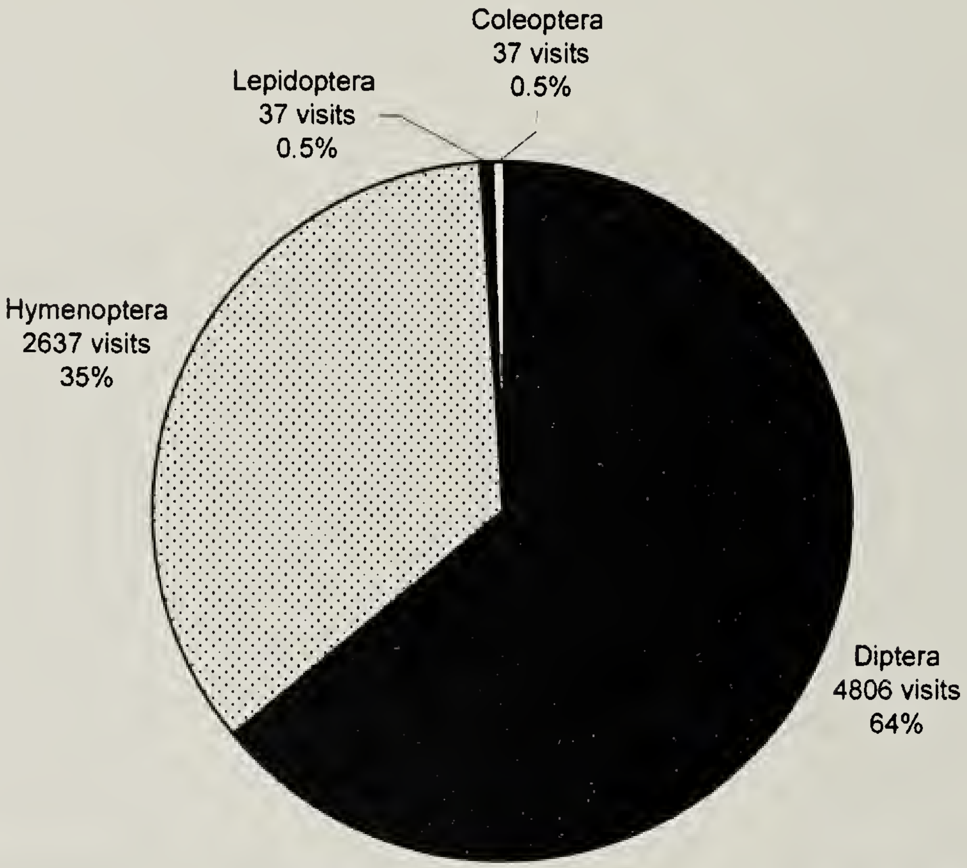


Figure 3. Percentage of visits by families in the order Diptera (n=4806)

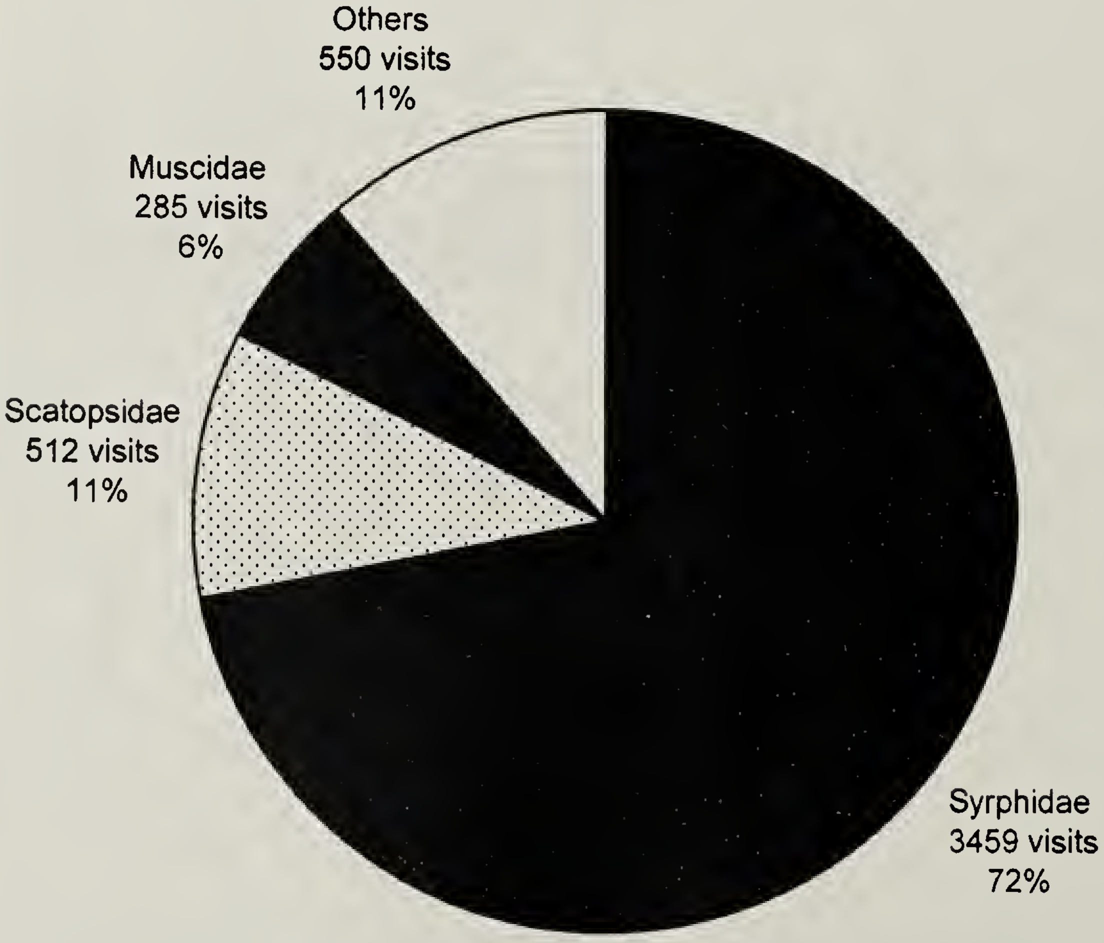


Figure 4. Percentage of visits by families in the order Hymenoptera (n =2637)

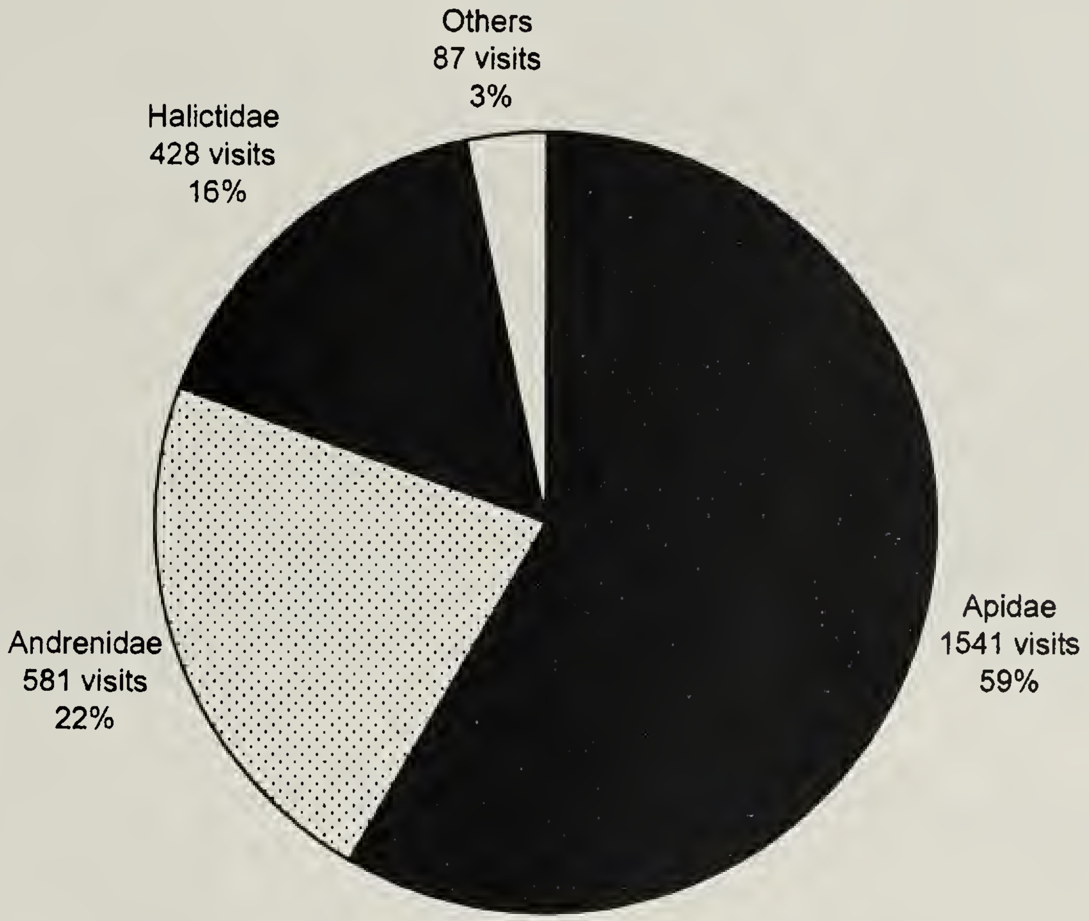
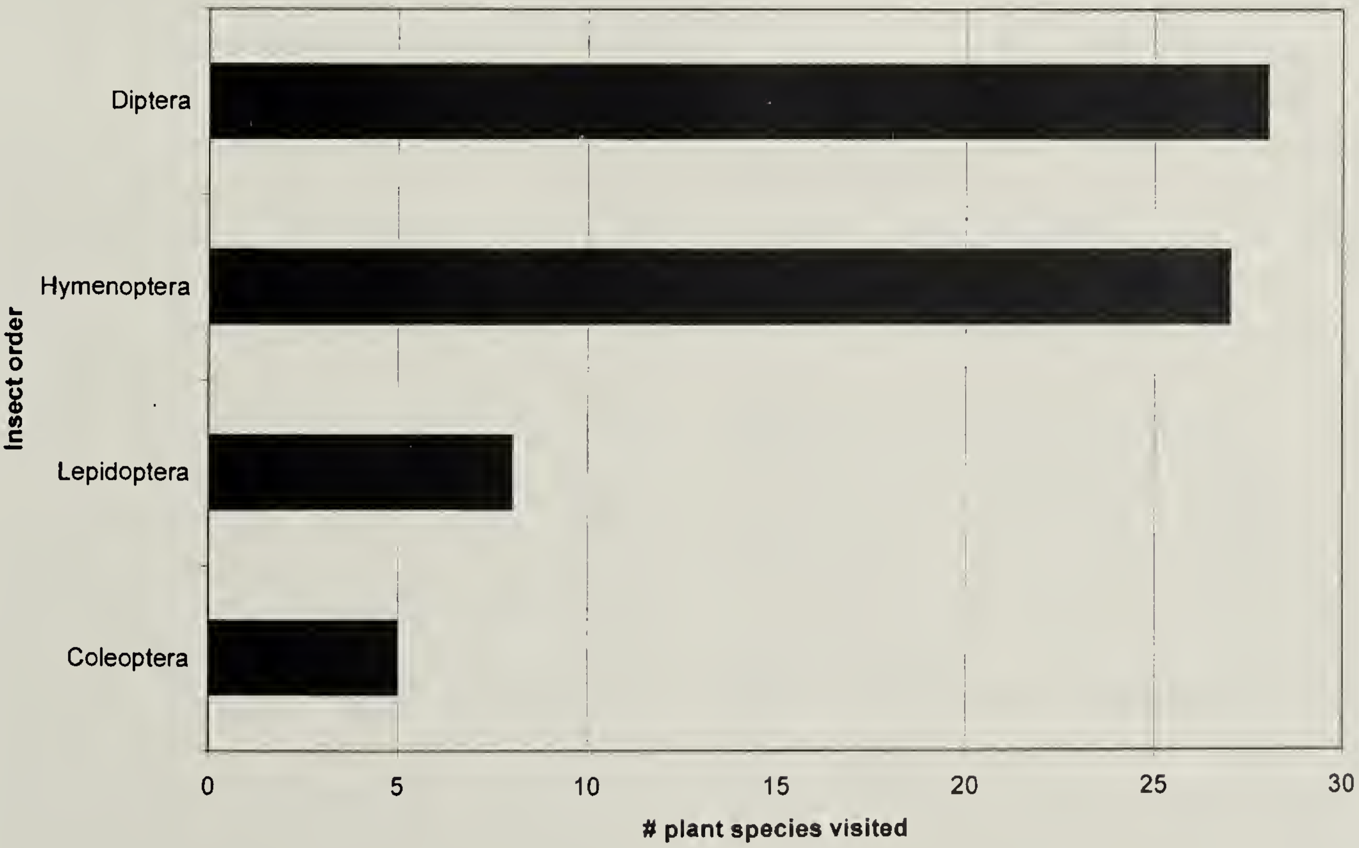


Figure 5. Mean number of plants species visited by species in each of four insect orders



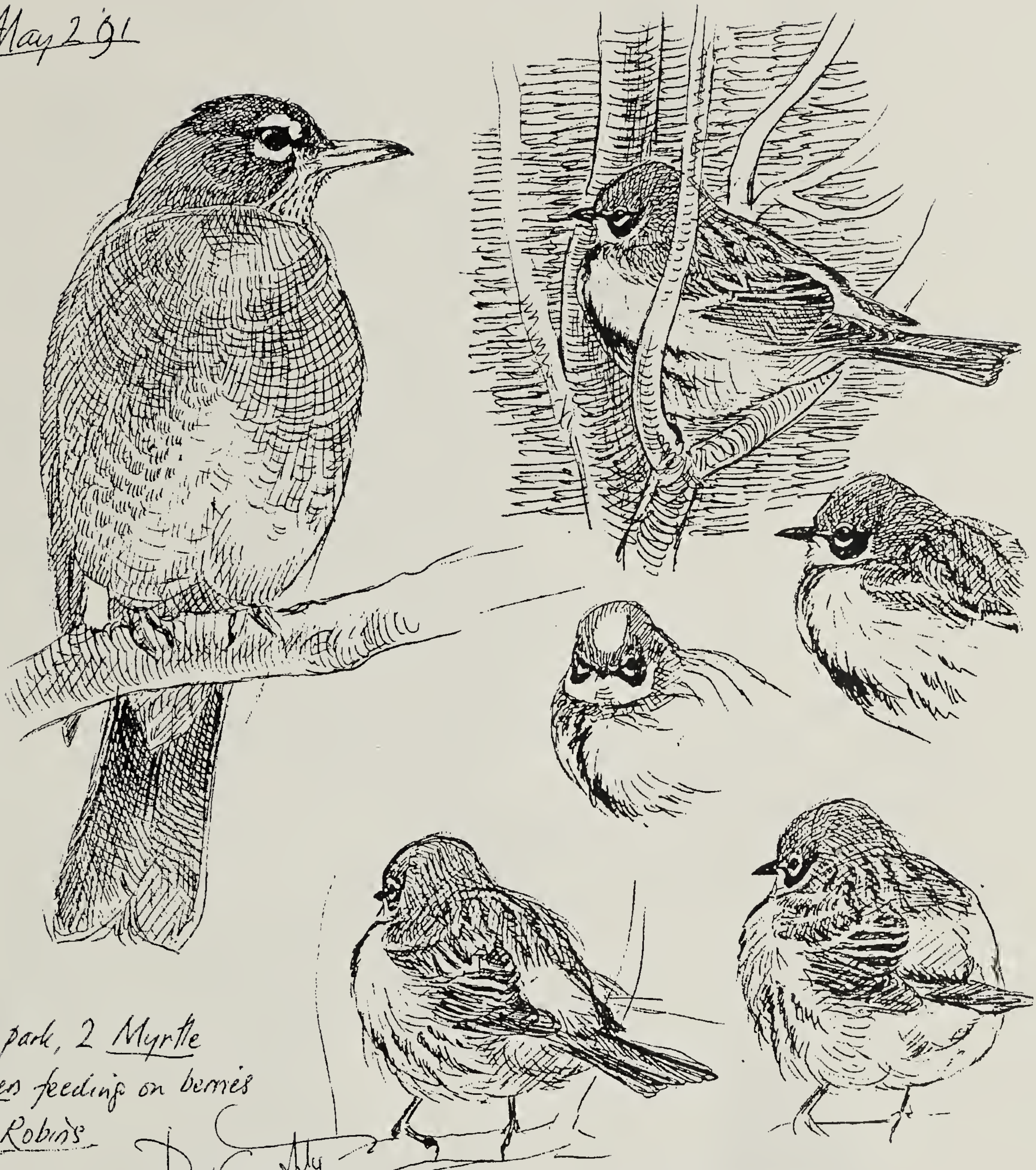
Bumblebee *Wayne Lynch*

the quality (i.e. proportion of conspecific versus foreign pollen) and quantity of pollen received by a plant from that species.[2] The observation of an insect feeding on nectar or collecting pollen means that the insect is a potential pollinator of that plant but of unknown efficacy.

These data indicate that dipterans, particularly hover flies, may play an important role in the pollination of plants in the tallgrass prairie. The lack of observations of lepidopterans throughout the entire summer, and the low number of bee visits early in the year, were likely due to the relatively cool, wet weather experienced in Manitoba in 2004. The provincial mean temperature from June to September was 15.3°C (the long-term average is 16.8°C) and the total precipitation from May to September nearly 450 mm (the long term average is 350 mm). Butterflies and bees generally require warmer temperatures before they become active (R. Roughley, Curator, J.B. Wallis Museum, University of Manitoba, pers. comm., 2004). Furthermore, the high moisture levels, particularly at the poorly drained TGPP site, may have reduced the available habitat for ground-dwelling bumblebees.[6] Thus, the proportion of flower visits among different insects observed in 2004 may not be typical of more average climate conditions.

Despite frequently visiting the same number of flower species, dipterans may be less efficient pollinators than bees, which tend to have higher fidelity to a plant species within a given foraging trip.[4] Very small flies may be able to "steal" nectar without actually receiving any pollen on their bodies.[4] Nonetheless many dipteran species have been found to play an important role in plant pollination.[3, 4] The results of this study show that that dipterans are frequent floral visitors in tallgrass prairie and may be important pollinators, particularly when climatic conditions are too cool for more efficient pollinators like bees and butterflies.

May 2 '91



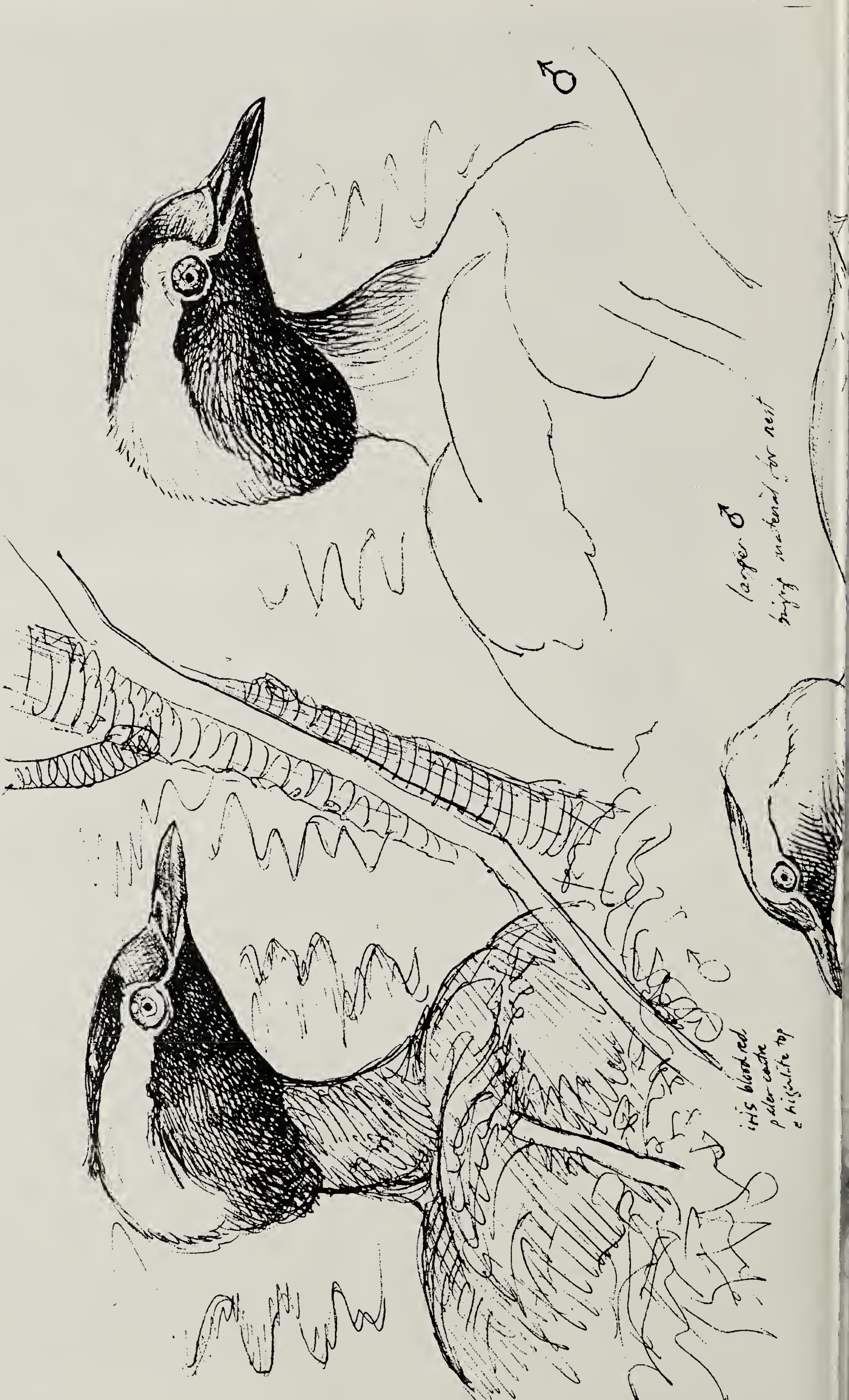
In park, 2 Myrtle Wblers feeding on berries with Robins.

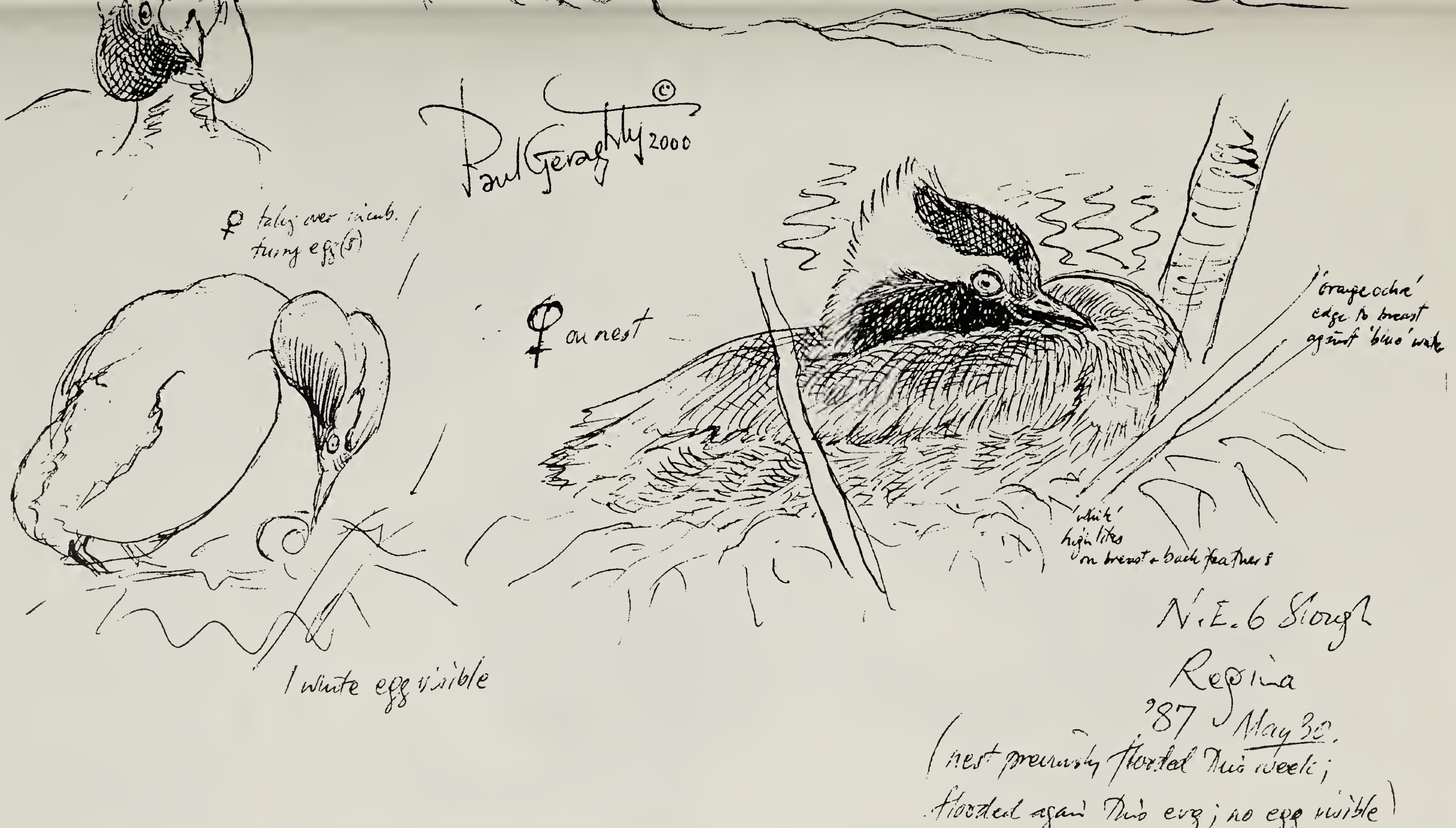
Paul Geraghty ©

©PG '91

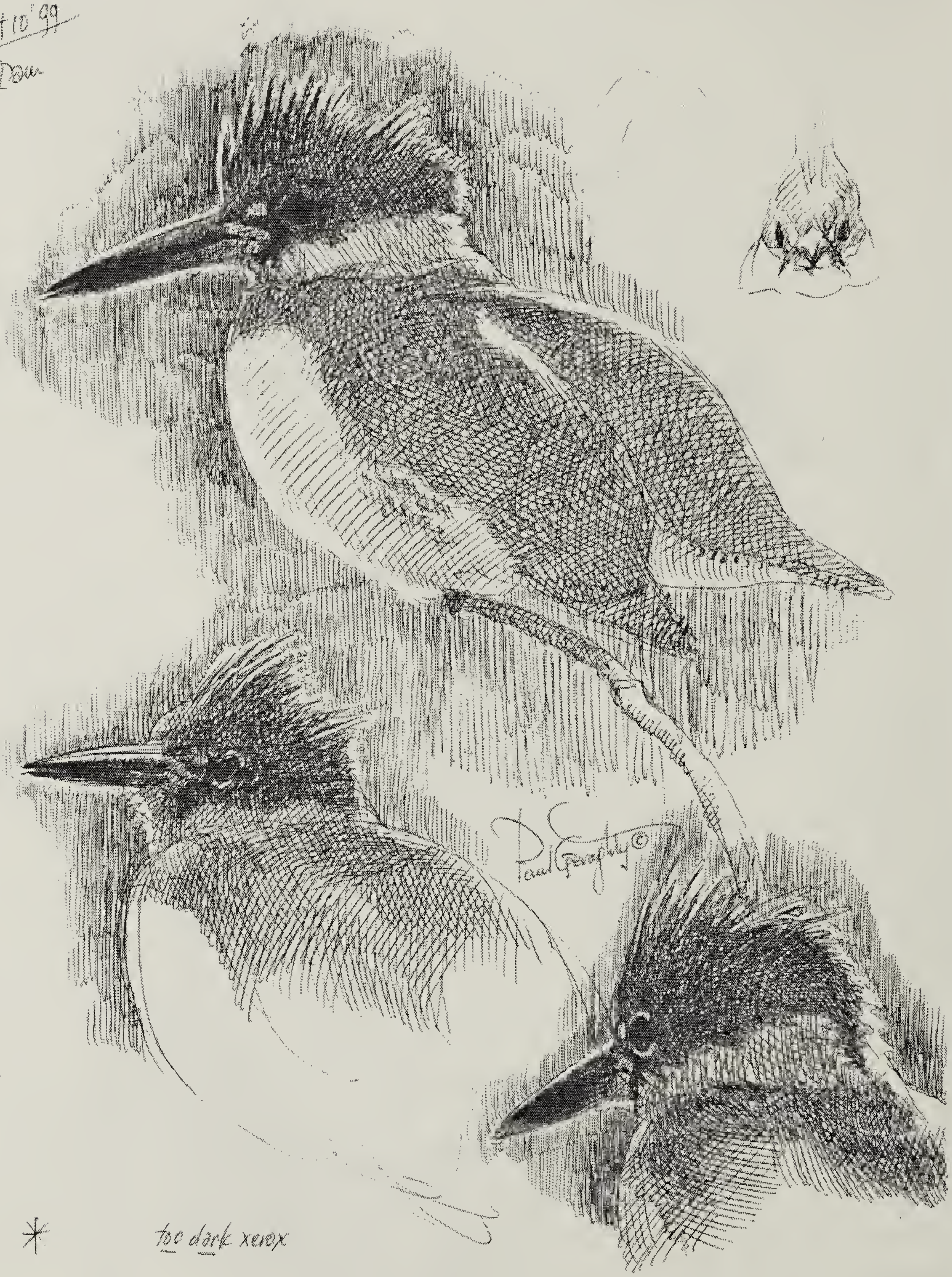
Stationary but turning head

A ♂ Myrtle Wbler which sat fluffed for a good ten minutes nr. my pked car @ Asphalt Wks Pool. 3 ♂♂ and 1♀ joined it in tree but were all more active. But he finally flitted about & then away c̄ others.


♂
larger ♂
bring material for nest
♂
iris blood red
paler centre
c highlite top


Paul Geraghty © 2000
♀ taking over incub. turning egg(s)
♀ on nest
1 white egg visible
'orange ochre' edge to breast against 'blue' water
'white' high lites on breast & back feathers
N.E. 6 Slough
Regina
'87 May 30.
(nest previously flooded this week; flooded again this eve; no egg visible)

Oct 10 '99
MJ Dau



Paul Geraghty ©

* too dark xerox

Acknowledgements

Support for this research was received from the Manitoba Government's Sustainable Development Innovation Fund and The Manitoba Museum Foundation. Volunteers from the Manitoba Museum, namely Karen Sereda, Janice Gallwey and Teresa Forhan, aided in the field work and specimen processing. Special thanks for Heather White for identifying the insect collection.

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CHECKLIST OF SASKATCHEWAN MOTHS: PART 15 - LUTE STRINGS, HOOKTIPS, URANIIDS AND GEOMETRIDS (1)

RONALD R. HOOPER, Box 757, Ft. Qu'Appelle, SK S0G 1S0

Parts 1 to 14 of this Saskatchewan moths series were previously published in *Blue Jay* and I am planning to write up more families in the near future.

Unless otherwise indicated, all the species are represented in the Royal Saskatchewan Museum collection in Regina. The species are arranged according to the website of Jim Troubridge and Don Lafontaine, *Moths of Canada*, updated by Greg Pohl in 2006.[6] This website also has color photographs of the moths. Other helpful websites and references are listed at the end of the article. The common names that are used are mostly according to R. J. L. Jones and C. V. Covell, Jr.[1,2] Recent name changes are according to Minet and Scoble, and Scoble. [4,5]

In this article, the size and early and late dates of Saskatchewan specimens is given. Some of the recorded food plants are mentioned. Abbreviations: s=south, n=north, w=west, e=east, CNC = Canadian National Collection in Ottawa.

Family DREPANID MOTHS (DREPANIDAE)

Subfamily LUTE STRINGS (THYRATIRINAE)

This is a small subfamily of medium-sized brown moths. The fore-wing discal spot is an enclosed circle. The larvae live in curled up leaves. Some larvae lack 'legs' near the end, so the last few segments stick up in the air. The Scribe is beautifully inscribed with black and white scroll work. The Peach Blossom Moth has beautiful pink blotches on the fore-wings.

The Scribe (Lettered Habrosyne), *Habrosyne scripta* (Gosse) - Central Sask., n. to Cumberland House and Meadow Lake Provincial Park; s. to Carlyle and Regina; also in Cypress Hills. (36-39 mm) (May 27-July 19). Reported on raspberry and other Rosaceae.

Tufted Thyatirid (Short-cloaked Lute String), *Pseudothyatira cymatiphoroides* (Gn.) - Central Sask., n. to Sturgeon Landing and Narrow Hills Provincial Park area; s. to Carlyle, Fort Qu'Appelle and Pike Lake; also at Saint Victor. (36-42mm) (June 17-July 25). Reported on birch.

Peach Blossom Moth (Dogwood Thyatirid), *Euthyatira pudens* (Gn.) - S. Sask, n. to Bjorkdale. (43-46mm) (May 5-27) Reported on dogwood.

Peach Blossom Moth / RSM collection, M. Janzen

Alberta Lute String, *Ceranemota albertae* Clarke - Fort Qu'Appelle. (34-36mm) (August 18-Sept. 4)

Subfamily HOOKTIP MOTHS (DREPANINAE)

These moths are medium-sized. Most species have the apex of the fore-wing extended out to a downward pointing tip. The body is rather slender, but short. The antennae of the males are usually pectinate (barbed). In Saskatchewan, we have four of the five species that are known to occur north of Mexico.

Arched Hooktip (Common Hooktip), *Drepana arcuata* Walker–N. Sask., s. to Greenbush and Meadow Lake Provincial Park. (28-32mm) (June 4-July 8). Reported on birch and alder.

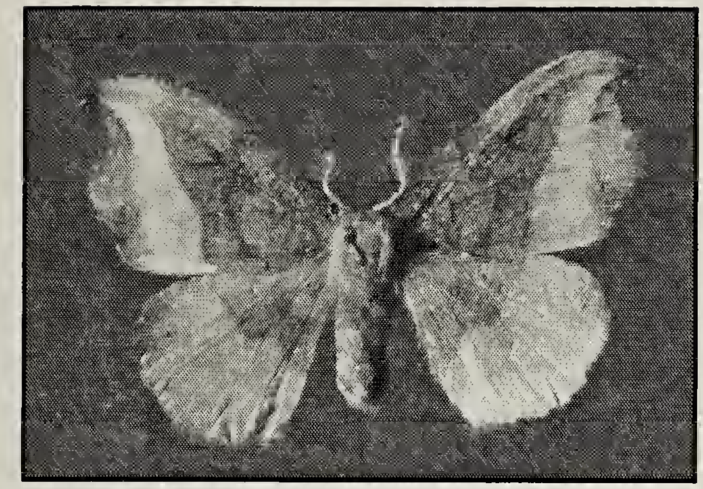
Two-lined Hooktip (Scalloped Hooktip), *Drepana bilineata* (Pack.)–Central Sask., n. to Bainbridge, La Ronge area and Clearwater River Provincial Park; s. to Kenosee Lake, Fort Qu'Appelle and Moose Jaw area. Also at Saint Victor. (28-38mm) (May 26-August 5) Reported on birch and bush cranberry.

Northern Eudeilinea, *Eudeilinea herminiata* (Gr.)–S. Sask., n. to Namew Lake, Emma Lake and Battleford Provincial Park. (23-27mm) (May 24-July 15)

Rose Hooktip, *Oreta rosea* (Wlk.)-Central Sask., n. to Otter Rapids; s. to Carlyle and Fort Qu'Appelle. (27-34mm) (July 5-19) Reported on birch and bush cranberry.

Family URANIID MOTHS, (URANIIDAE) (EPIPLEMIDAE)

This is mainly a tropical family. Our 2 Canadian species are small (wingspan about 20 mm), with notched



Rose Hooktip / RSM collection, M. Janzen

hind wings. The larvae feed in a web when young.

Maltese Cross (Gray Scoopwing), *Callizia amorata* Pack.–S. Sask., n. to Madge Lake and Pike Lake. (14-20mm) (June 1- July 18) Reported on honeysuckle.

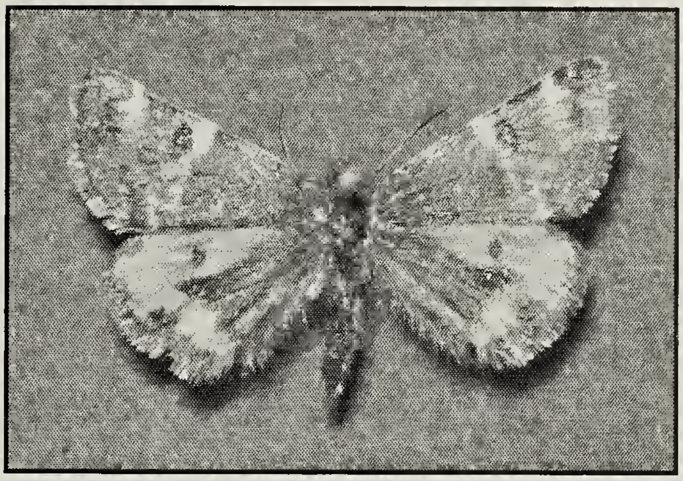
Family GEOMETRID MOTHS (GEOMETRIDAE)

This large family of moths is exceeded in numbers of species only by the Owlet Moths (Noctuidae). They are usually rather small with slender bodies and delicate wings. The caterpillars are often called 'measuring worms' or 'loopers' because they lack two or three pairs of legs in the middle. With legs only at the front end and the back end, they stretch themselves forward, grab hold with the front legs and pull themselves ahead, with the legless middle looped up. Some have imagined that when they crawl on you like this that they are measuring you for a new suit!

Subfamily ARCHIARINAE

These are hairy moths which are dayfliers early in the spring. In flight, the bright-coloured Infant is often mistaken for a butterfly. The Early Geometer is sometimes seen during a spring thaw when one might have a shovel in his hands instead of an insect net.

The Infant, *Archiearis infans* (Mosch.) (*Brephos infans*)–Central Sask., n. to Narrow Hills Provincial Park area; s. to Moose Mountain Provincial Park, Craven and Dundurn; also at Willowbunch and Saint Victor. (30-32mm) (April 7-May 10) Reported on birch.



The Infant / RSM collection, M. Janzen

The Early Geometer, *Leucobrephos brephoides* (Walker)–S. Sask., n. to Nipawin area and Candle Lake area. (25-30mm) (March 24 - May16) Reported on aspen and birch.

Subfamily ENNOMINAE

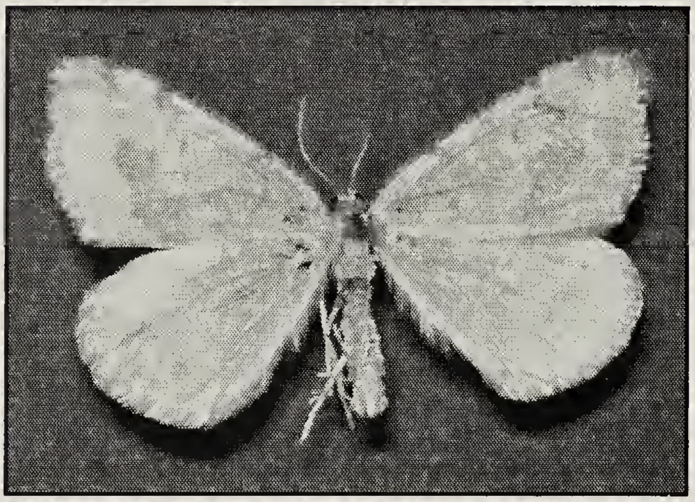
This is the largest subfamily of geometrid moths in Canada. It contains our largest geometrid moths (up to 48 mm in wingspan) as well as medium-sized ones. The males usually have a blister-like structure at the base of the fore-wings between the veins. In a few species, the females are wingless, or have greatly reduced wings.

Virgin Moth, *Protitame virginalis* (Hulst)–Throughout Sask. (20-26mm) (May 27-July 15) Reported on aspen and willow.

Brown-bordered Geometer, *Eumacaria latiferrugata* (Walker)–S. Sask., n. to Harlan. (23-25mm) (June 1- August 13) Reported on cherry.

Lesser Maple Spanworm, *Macaria pustularia* (Gn.) (*Itame pustularia*)–Reported for south-central Sask.[3] Reported on maples.

Gooseberry Spanworm, *Macaria ribearia* (Fitch) (*Itame ribearia*)–S. Sask., n. to Earl Grey and Lloydminster area. (26-29mm) (July 9-August 5) Reported on gooseberry and currant.



Gooseberry Spanworm / RSM collection, M. Janzen

Western Sulphur, *Macaria occiduaria* (Pack.) (*Itame occiduaria*)–S. Sask., n. to Cumberland House and Loon Lake. (25-29mm) (June 12-Oct. 26) Reported on saskatoon-berry and currant.

Northern Grey, *Macaria andersoni* (Swett.) (*Itame andersoni*)–N. Sask., s. to Nipawin, Two Forks River and Meadow Lake Provincial Park. (22-30mm) (June 29-Aug. 16) Reported on blueberry.

Spotted Sulphur, (*Macaria sulphurea* (Pack.) (*Itame sulphurea*)–S. Sask., n. to Nipawin and Meadow Lake Provincial Park. (24-27mm) (June 29-Sept.12) Reported on blueberry and bog myrtle.

Striped Ochre, *Macaria brunneata* (Thunberg) (*Itame brunneata*)–N. Sask., s. to Squaw Rapids and Meadow Lake Provincial Park; also at Moose Jaw and Cypress Hills. (22-28mm) (July 5-August 15) Reported on aspen, buffalo-berry, blueberry and birch.

Birch Granite, *Macaria anataria* (Swett.) (*Itame anataria*)–Geikie River and Prince Albert. (24mm) (August 15) Reported on birch, shrubby cinquefoil and alder.

Russian Granite, *Macaria loricaria* (Evers.) (*Itame loricaria*)–Throughout Sask. (Males 25-28mm) (June 10-August 19) Reported on aspen and willow.

Speckled Granite, *Macaria exauspicata* (Wlk.) (*Itame exauspicata*)–S. Sask., n. to Pelican Narrows and Turtle Lake. (21-25mm) (June 30-July 27). Reported on willow and poplar.

Four-spotted Granite, *Macaria coortaria*, (Hulst) (*Itame coortaria*)–S. Sask., n. to Goodeve and Macklin area. (22-25mm) (June 20-July 27) Reported on chokecherry.

Short-lined Granite, *Macaria bitactata* (Wlk.) (*Itame bitactata*)–S. Sask., n. to Somme and Lloydminster area. (20-27mm) (July 11-August 28) Reported on alder and gooseberry.

Decorated Granite, *Macaria decorata* (Hulst) (*Itame decorata*)–Great Sand Hills, s. of Portreeve. New Sask. Record, collected by N. Page, July 24, 2005. (25-30mm) Reported on currant and gooseberry.

Black-banded Orange, *Macaria trunctaria* (Wlk.) (*Epelis trunctaria*)–N. Sask., s. to Spy Hill and Douglas Provincial Park; also in Cypress Hills. (25-30mm) (May 14-July 5) Reported on bearberry.

Common Angle, *Macaria aemulataria* Walker (*Semiothisa aemulataria*)–S. Sask., n. to Fort Qu'Appelle, Pike Lake area and Macklin area. (18-26mm) (May 19-August 15) Reported on maple.

White Peacock, *Macaria ulsterata* (Pears.) (*Semiothisa ulsterata*)–N. Sask., s. to Greenbush and Buffalo Narrows; also at Wood Mountain Park. (26-29mm) (June 15-July 15) Reported on birch and alder.

Bicolored Angle *Macaria bicolorata* (Fab.) (*Semiothisa bicolorata*)–Central Sask., n. to Key Lake area and mile 84 on Cluff Lake Road; s. to Roche Percee, Prince Albert and Meadow Lake Provincial Park; also in Cypress Hills. (23-27mm) (June 28-July 10) Reported on pine.

Larch Angle, *Macaria sexmaculata* (Pack.) (*Semiothisa sexmaculata*)–N. Sask., s. to Estevan area, Lumsden area and Saint Walburg. (20-23mm) (May 28-July 7) Reported on tamarack.

Pale-marked Angle, *Macaria signaria dispuncta* (Wlk.) (*Semiothisa signaria dispuncta*)–N. Sask., s. to Kamsack, Pleasantdale and Harlan; also in Cypress Hills. (22-29mm) (June 12-August 11) Reported on spruce, tamarack and pine.

Ferguson's Angle, *Macaria marmorata* (Fgn.) (*Semiothisa banksianae*)–N. Sask., s. to Greenbush, Fort a la Corne and Harlan; also in Cypress Hills. (27-29mm) (June 11-July 15) Reported on pine.

Submarmorate Angle, *Macaria submarmorata* Wlk.(*Semiothisa submarmorata*)–Glen Elder (e. of Swan Plain), Shoal Lake and Harlan. (20mm) (July 7). Recorded on tamarack.

Beautiful Angle, *Marcaria oweni* (Swett.) (*Semiothisa oweni*)–Central Sask., n. to La Ronge area, s. to Fort Qu'Appelle area and Harlan. Reported on tamarack, balsam fir, spruce and pine.

Seton's Granite, *Digrammia setonana* (McD.) (*Semiothisa setonana*)–Fort Esperance, Fort Qu'Appelle and Moose Jaw. (27-28mm) (July 21-August 3) Reported on juniper.

Shaded Granite, *Digrammia curvata* (Grote) (*Semiothisa curvata*)–Roche Percee, Rockglen and Grassland's Park (e. block and w. block). (24-25mm) (June 12-August 25) Reported on rabbitbush.

Striped Granite, *Digrammia denticulata* (Grt.) (*Semiothisa denticulata*)–Throughout Sask. (23-27mm) (May 14-August 25) Reported on chokecherry.

Colorado Granite, *Digrammia delectata* (Hulst) (*Semiothisa delectata*)–E. of Rosefield (Grasslands National Park, w. block) (Specimen is in CNC, Ottawa.) (May 28, 1986) Taken among Creeping Juniper.

California Granite, *Digrammia californiaria* (Pack.) (*Semiothisa californiaria*)–S.W. Sask., n. to Douglas Provincial Park and Winter; e. to Big Muddy Lake and Buffalo Pound Provincial Park. (23-26mm) (May 31-Sept 4)

Willow Granite, *Digrammia decorata arubrescens* (McD.) (*Semiothisa arubrescens*)–S. Sask., n. to Greenbush. (24-27mm) (June 16-21) Reported on willow.

Northern Granite, *Digrammia rippertaria* (Dup.) (*Semiothisa hebetata*) (Hulst)–Throughout Sask. (23-25mm) (June 8 - August 16) Reported on willow.

Dark-bordered Granite, *Digrammia neptaria* (Gn.) (*Semiothisa neptaria*)–S. Sask., n. to Otter Rapids. (21-28mm) (May 14-August 26) Reported on willow and poplar.

Honeystreak *Digrammia mellistrigata* (Grote) (*Semiothisa mellistrigata*)–S. Sask., n. to Creighton area. (22-25mm) (June 13-August 14). Reported on willow.

Splendid Granite, *Digrammia subminiata* (Pack.) (*Semiothisa subminiata*)–Saint Victor, Rockglen area and Grasslands National Park (w. block) (23-24mm) (June 26-August 10)

Arizona Dainty, *Narraga fimetaria partitaria* (Grt.)–Rockglen, Val Marie and Grasslands National Park (w. block). (16-18mm) (June18-July 1).

EXPECTED SPECIES

Brown Scoopwing, *Calledapteryx dryopterata* Grote–W. To Aweme, Manitoba. (July 12, 1920) J.B. Wallis.

One-spotted Granite, *Macaria unipunctaria perplexa* (McD.) (*Semiothisa unipunctaria perplexa*)–B.C. e. to Cypress Hills, Alberta.

Acknowledgements

I thank Greg Pohl of Edmonton, AB for checking this manuscript and giving helpful suggestions.

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"Yes, as a matter of fact, a pelican's 'bill can hold more than its belly can:– about three gallons of liquid in the pouch of a white pelican, compared to a stomach capacity of a little more than a gallon."

- Scott Weidensaul, *The Birder's Miscellany*, p.10

Canada Goose on nest, Beaver Creek Conservation Area near Saskatoon, May 2005. *Claire Jardine*

NOTES AND LETTERS

PREDATION TRIAD: PRAIRIE FALCON, AMERICAN KESTREL AND HORNED LARK

Raptors are not necessarily safe from other larger raptors. This may be especially true when one is distracted while killing and eating its own prey.

On July 29, 2000 at 2045h, while surveying for Burrowing Owls in the west block of Grassland National Park in southern Saskatchewan, we observed a female Prairie Falcon on the ground at the north end of the Larson Black-tailed Prairie Dog colony, (49E15' N, 107E5' W), about 21 km southeast of Val Marie, SK. The Prairie Falcon was clearly visible in the short cropped vegetation of the prairie dog colony and was obviously plucking a dead bird. We watched the falcon with binoculars for about 30 minutes at dusk, then drove closer causing the falcon to fly off with its prey. A pile of feathers remained. Close inspection showed that the feathers were those of a female American Kestrel. However, there was a totally plucked carcass and feathers of a Horned Lark under the pile of kestrel feathers. The head of the lark was missing but the body had not been fed upon.

We surmise that the kestrel had killed the lark and had just finished plucking it when the Prairie Falcon surprised the smaller falcon and killed it on top of the lark. We surmise that the kestrel was very obvious in the short vegetation of the prairie dog colony. The fact that the kestrel feathers were on top of the lark feathers, suggests that the kestrel probably did not see the larger falcon approach. If the kestrel had had any warning, we assume that it would have tried to leave with or without the lark body, and its feathers would have been found distant from those of the lark.

American Kestrels are not common breeders in the Park but they appear to nest in a building about 1 km from the Larson Colony. Prairie Falcons have occasionally attempted to nest in the Park but are usually not successful. We commonly see Prairie Falcons in the Park in July after the year's young falcons would have dispersed and in fact a week earlier, on July 20th, we recorded a female Prairie Falcon landing on the ground in the same prairie dog town.

Horned Larks are not a common food item for kestrels but have been included in the published list of prey items.[4] Only 6% of kestrel diet is small birds, but a horned lark is certainly within the size range of bird prey.[5] However, no records of Prairie Falcons preying on other raptors were noted by Sherrod's and Steenhof's reviews.[4,5] A kestrel is well within the size range of Prairie Falcon prey.[5] Prairie Falcons often pursue prey using a high-speed flight very low to the ground [1,2] and such a hunting strategy would be effective as a surprise attack on this particular kestrel. Our observation appears to be unusual since it involved a raptor killing a raptor while it was preparing to eat a prey.

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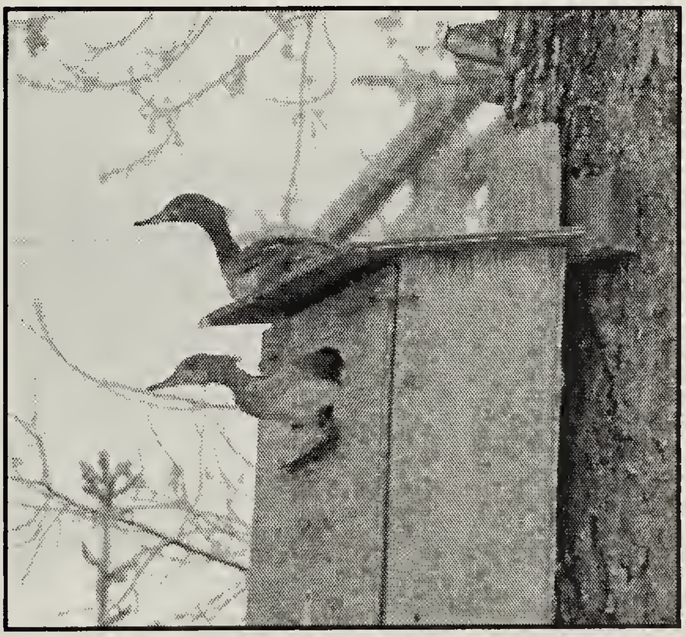
- *Geoffrey L. Holroyd* and *Helen Trefry*, Canadian Wildlife Service, Room 200, 4999 - 98 Ave, Edmonton, AB T6B 2X3; *Enrique Valdez*, Guadalajara, Jalisco, Mexico and *Jerry Batey*, 4806 Arlene Dr., Corpus Christi, Texas, 78411. Email: geoffrey.holroyd@ec.gc.ca, helen.trefry@ec.gc.ca

TREE NESTING DUCKS NEAR GRANDVIEW, MB

Grandview is a small Manitoba community nestled between the Duck Mountains and the Riding Mountains about 40 miles east of the Manitoba-Saskatchewan border. The Valley River, which originates in the Duck Mountains and eventually empties into Lake Dauphin, flows more or less all summer and meanders along the edge of town.

Three species of cavity nesting ducks, Hooded Mergansers, Common Mergansers and Common Goldeneyes, make the river their summer home and are common near Grandview. I have placed nest boxes along the river on a friend's property about three miles north-east of Grandview. Most years, both goldeneye and Hooded Mergansers nest in these boxes. (Hooded Mergansers are the most common in this area.) One nest box larger than the others has had as many as 38 eggs, about equally divided among the three species of ducks. This nest has never had an incubating female. On two occasions, however, we have observed a Hooded Merganser successfully hatch goldeneye eggs, two on one occasion and three on another. We have also observed a Goldeneye successfully hatch two Hooded Merganser eggs.

My house is situated approximately three blocks from the river in a residential area of town. I have a nest box about 20 feet above ground in a Manitoba Maple just a few feet from our deck. We have had both goldeneyes and Hooded Mergansers lay eggs in this nest. On two occasions, a Hooded Merganser has successfully hatched young. We have not had goldeneyes nest successfully, but they have laid eggs in the nest. In 2001, the nest contained seven goldeneye eggs and eight Hooded Merganser eggs. It was finally deserted by both females.



Our nest box with two female Hooded Mergansers apparently inspecting and perhaps sorting out property rights.
John Ross

The school in Grandview is two blocks from our home and about five blocks from the river. Across the street from the school was an old house with an unused chimney. Most springs since 1967 and over roughly a 20 year period, I was able to watch a Common Merganser enter the chimney from the top to get to its nest inside. On three occasions students brought "pointy-beaked" ducklings to the class thinking, I suppose, they were orphans. On each occasion, the birds were released when the female was nearby and the brood continued its interrupted march to the river.

One day in the early 1980s, a friend and I were sitting on our front step. It was early afternoon in mid-May and a typical gusty spring wind was blowing. I observed the female Common Merganser flying along the school grounds coming from the direction of its nest. As it neared I could see it was carrying something in its beak. A particularly strong gust of wind caused the bird to dip and drop what it was carrying about 30 yards from where we sat. The bird flew on towards the river. We went over to the spot where the object had fallen and found a broken egg containing a fully developed embryo, (but the yolk sac was still outside the body indicating it was not quite ready to hatch). The embryo was still moving when we arrived. The bird had successfully carried the egg two and one-half blocks, about half the distance from its nest to the river. I watched for the remainder of the day, and the following day to see if the duck would attempt another "run." She did not and I have not observed this behaviour since. If anyone has observed similar behaviour, I would appreciate hearing from them.

- *John Ross*, Box 308 Grandview, MB R0L 0Y0, E-mail: rossie@mts.net

EURASIAN COLLARED-DOVE NEST WITH TWO BROODS IN DELISLE, SK.

Tom Lawton phoned on July 16, 2005 to say a Eurasian Collared-Dove was on its nest in a spruce in his front yard at 119 Third Avenue East in Delisle (Figure 1). On August 12, when EMH climbed 9 m to the nest he found two tiny young about three days old. They were too young to band, so we returned on August 19 when the nest contained two nestlings, one alive, the other dead. EMH banded the live bird, which fledged about a week later and partook of food at the Lawton feeding station. He removed the dead bird, which had its intestines hanging out and may have been killed by a Common Grackle; Tom Lawton had observed one disturbing the doves the previous evening.

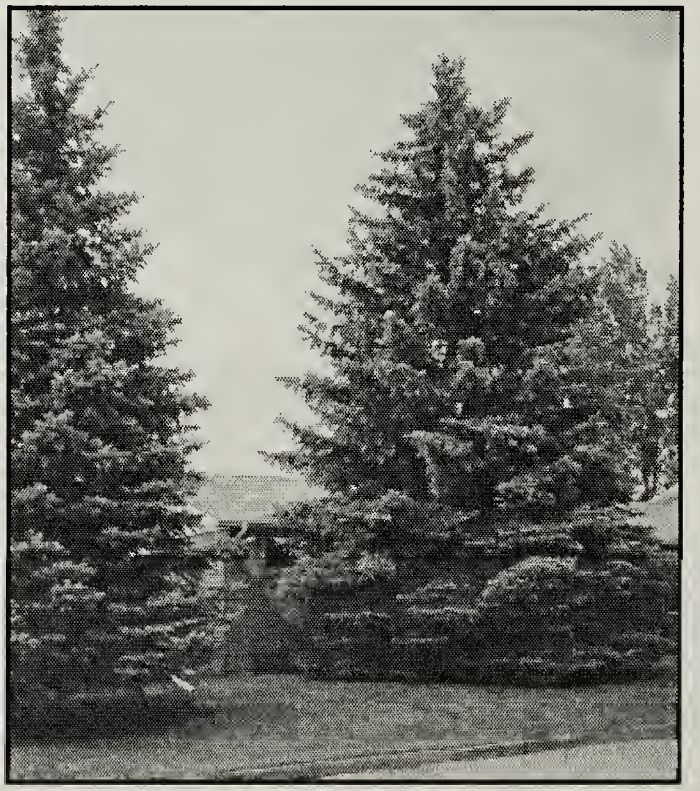


Figure 1. Nest tree in Delisle

The female must have soon laid another two eggs in the same nest and began incubating because when Erik climbed again on 25 September, a nestling flew from the nest. After a flight of about 20 m, the bird landed in shrubs near the front step of the Lawton's neighbour, two doors to the west. Simultaneously a Sharp-shinned Hawk, which had been perched in a tree across the street, flew directly at the dove. The nestling dove had four visible body puncture wounds as a result. It took a few deep breaths and then became very still. We felt certain it was dying but after about three minutes of warming in our hands, it appeared to revive. Ten or so minutes later its condition appeared stable, so we banded it and Erik replaced it in the nest. There was also an addled egg in the nest. To everyone's amazement, the injured nestling survived and within two days it was feeding with its parents on the Lawton feeding table, where it visited off and on for another week.

This was the first fully documented Eurasian Collared Dove nest for the Saskatoon Bird Area. The first presumed Eurasian Collared-Dove nest was found on July 17, 2004 by Margaret Madsen, about 11.6 m above ground in a different large spruce in Delisle, but that nest apparently had been vacated prior to David Miller's climb and inspection on that date.[1]

Eurasian Collared-Doves are known to nest two or three times in a summer, even at this northern latitude.[2] This is the first pair in Saskatchewan reported to raise young successfully twice in one year – and, unusually, from the same nest.

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- *C. Stuart Houston*, 863 University Drive, Saskatoon, SK S7N 0J8 and *Erik M. Hedlin*, 830 Swan Crescent, Saskatoon, SK S7J 5C7

POPULATION EXPLOSION OF DWARF CANADIAN PRIMROSE NEAR THE PAS, MB

I was surprised to find Dwarf Canadian Primrose, *Primula mistassinica,* at Atikameg Lake north of The Pas in mid-May, 1950. Quantities were growing in moss, covering limestone rocks on the shores of the lake. The crashing waves of clear, crystal water of this vast lake kept the moss wet. A narrow ribbon could be seen of the pink flowers along the beach, a rare white form occurring with the pink flowers. The late H. J. Scoggan confirmed the identification of the specimen and annotated my herbarium sheet.

Dwarf Canadian Primrose just northeast of Nipawin, SK May 31, 2005
John Hauer

Since World War Two, clay has been taken from the sides of the road to the lake (Hwy 10), leaving saucer-shaped shallow ditches on both sides for many miles. In the early 1960s, the primrose became established here and spread rapidly in the wet ditches. With good drainage, the water would be only a few inches deep and even this would evaporate leaving only wet clay.

A remarkable thing began to happen. The plants increased at first in the hundreds, then into many thousands.

Now 55 years later, there is a pink haze filling the ditches for miles as one drives along Hwy 10. Curiously enough, there does not seem to be any visible variation in the plants; the white form has failed to show here.

- *Walter Krivda*, P.O.Box 864, The Pas,
MB R9A 1K5

SNOWSHOE HARE AND FISHER ENCOUNTER

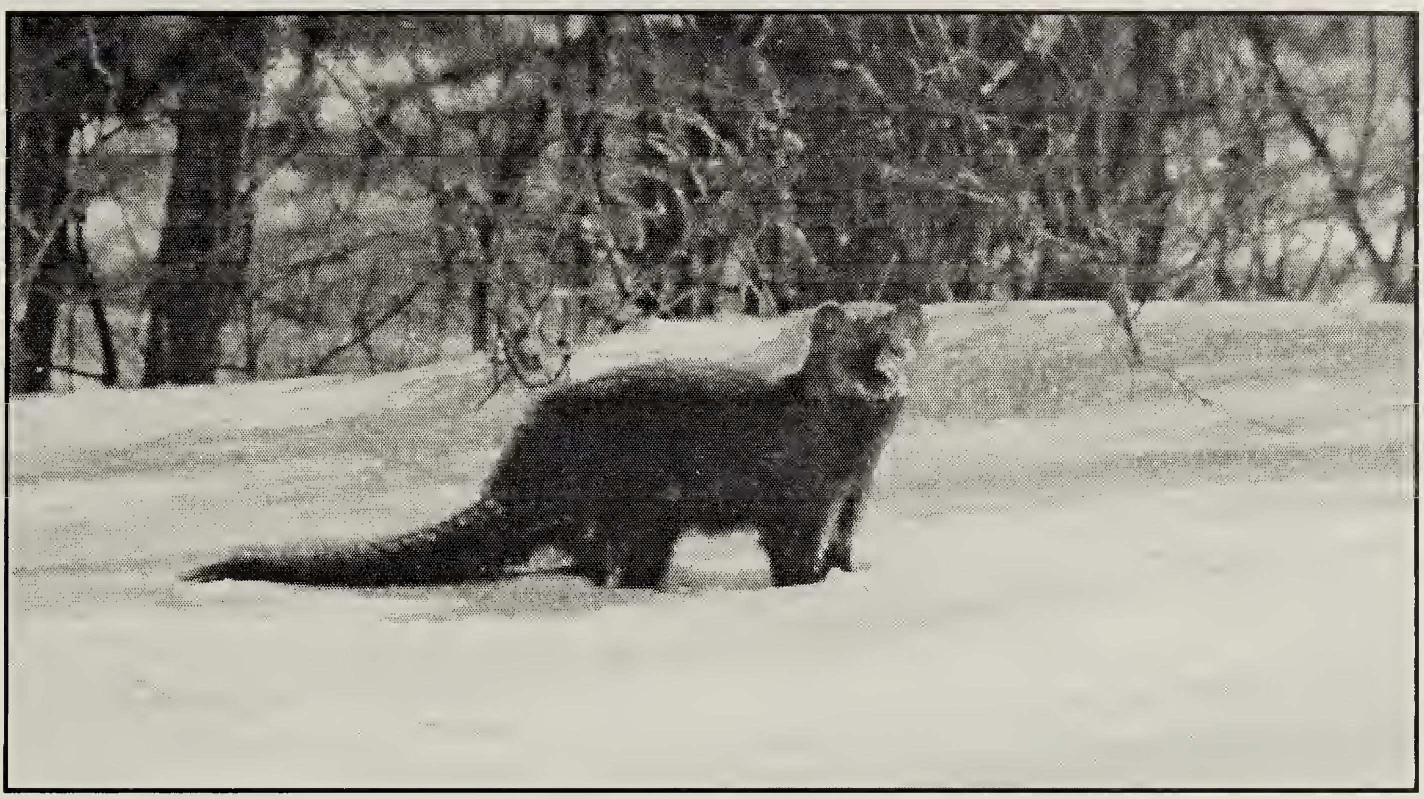
Snowshoe Hare, February 11, 2006
Brent Terry

As licenced bird banders, we travel across the boreal forest area almost every weekend during the winter in search of Great Gray and Northern Hawk owls to band. Some winters, like 2004- 2005, yield large numbers of owls, while in most winters, spotting and banding these elusive birds proves time consuming and we have only limited success. Lack of food (small rodents) forces these owls to hunt outside their natural habitat only every four years or so.

The winter of 2005-2006 would be classified as a typical year in terms of banding: lots of time, thousands of kilometers, and only a few owls. On February 10-11, we traveled from Prince Albert east along Hwy 55 to Hwy 9, north to The Pas, Manitoba, then back south along Hwy 9 to Hudson Bay and along Hwy 3 to Saskatoon. Based on the fact that we caught five Northern Hawk Owls and one Great Gray, we considered the trip successful but what we witnessed on February 11 made it one that we will remember forever.

While heading south on Hwy 9 towards Hudson Bay on the afternoon of February 11, we noticed an animal cross the road 1/4 km or so ahead of us. Before we could reach for our binoculars to identify it, the animal disappeared into the bush. As we continued along slowly, a Snowshoe Hare crossed the ditch and proceed down the road toward us. Then we noticed a dark, slender animal in pursuit, which we realized as it approached us, was a fisher.

The fisher chased the hare across the ditch and into the thick bush but as we were about to get back into our vehicle, the hare reappeared from the ditch and ran down the road toward us again. A few seconds later, the fisher also reappeared and gave chase once



Fisher, February 11, 2006 *Brent Terry*

more. Both prey and predator literally passed within a meter of us, as we stood beside our truck. The hare would disappear for varying amounts of time, 5 to 20 minutes, before reappearing. The fisher spent a lot of time running and snuffling in the snow along side the road when the hare was not visible, but when the hare reappeared on the road, it went after it. This scene played out before our eyes for a good hour or so before both animals disappeared into the dense bush for good.

- *Brent Terry*, 64 Maclean Crescent, Saskatoon, SK S7J 2R7 and *Mike Blom*, 920 3rd Street East, Saskatoon, SK S7H 1M7

Northern Hawk Owl, late December near Candle Lake, SK *Mike Blom*

SQUIRRELLY ACTIVITY AT WASKESIU, SK

My family has long suspected that our portable cabin in the Waskesiu townsite, within Prince Albert National Park, belonged more to a lineage of Red Squirrels (*Tamiasciurus hudsonicus*) than to the seasonal human occupants. The extent of squirrel domestic activity was revealed when we raised the cabin in preparation for renovations in early summer 2000.

Like all the portable cabins built in Waskesiu in the early 1950s, the main structure measured 14 by 20 feet and was supported by three wooden 6" x 8" beams that ran the length of the building. The beams or skids rested on cement blocks 10" high so that the entire building could be easily lifted and removed if necessary. Due to the gradual slope of our lot toward a stand of young White Spruce, the upslope side of the cabin was lower to the ground and, with rapid accumulation of soil, not only the cement blocks on this side but several inches of the wooden support beam became buried in the ground. Thus, this side became a protected space. On the downslope side, the attached deck, enclosed with lattice, kept the topography of the area unchanged. (Figure 1)

Upon raising the cabin, the extent of the squirrel's nest (A in Fig. 1) located on the upslope side was revealed. A mound of largely fiberglass insulation, measuring about 3 ft by 6 ft, filled the

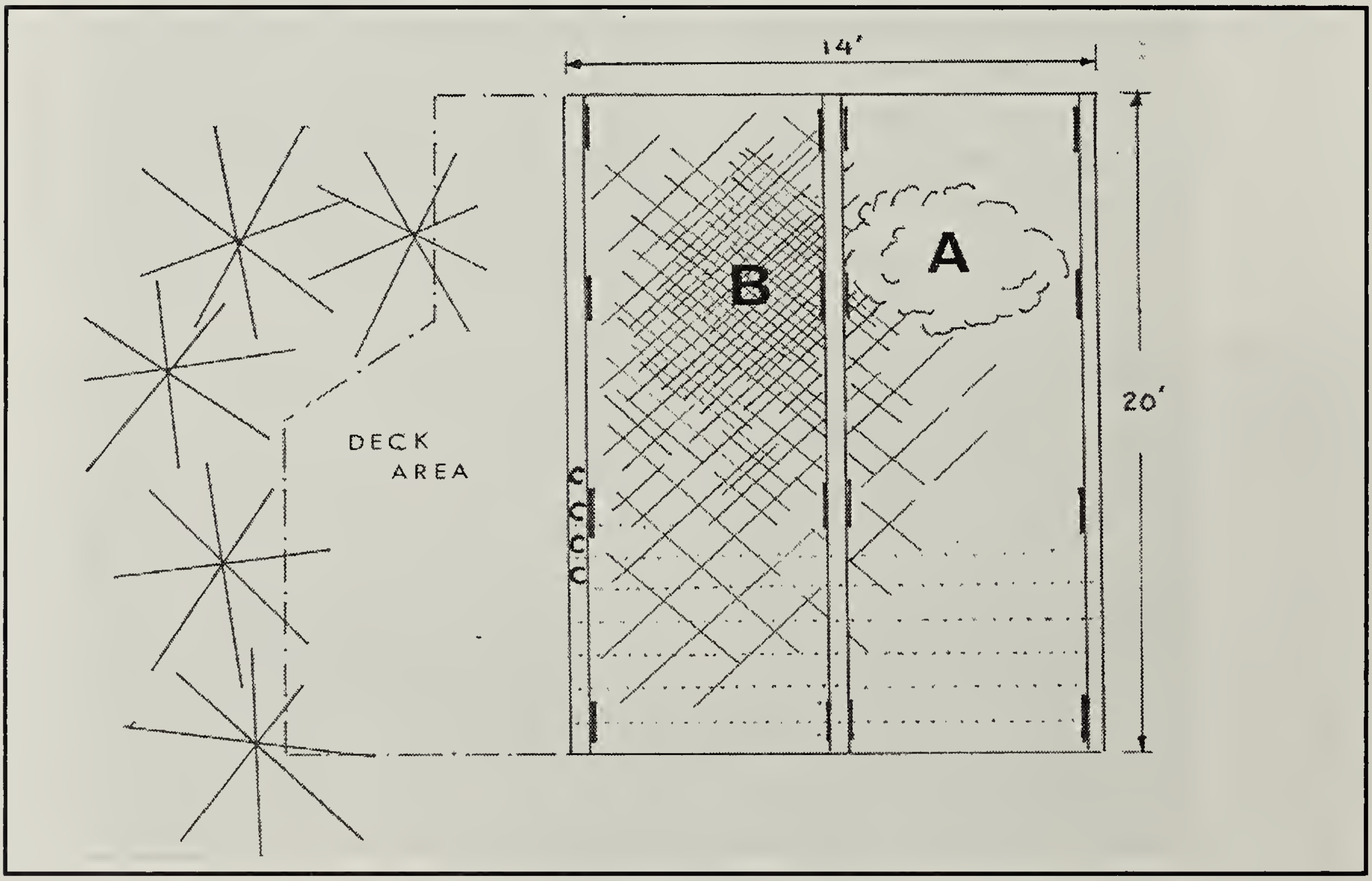


Figure 1. Figure 1 shows the lower support structure of the cabin in relation to the deck area and area of spruce trees. The nest location is indicated by letter A. The area of spruce cone litter, B, is indicated by crosshatching and the density of lines connotes depth of the piles of cone scales. The four small Cs located next to the deck area are the positions of bones and teeth located on a 6"x8" support timber and placed between the 2"x 4" floor joists that are at one foot centers. The joists (not all shown) are indicated by the dotted lines.

space to a depth of a foot. The yellow and pink strands of insulation created the impression of a huge ball of spun candy. In volume, it filled a large green garbage bag. Although the squirrels most likely began to occupy this site in the 1960s, fiberglass insulation wouldn't have become available until the advent of a few new insulated cabins in early 1980s. Many hundreds of foraging trips to at least two sources of insulation, judging from the mixture of colours of fiberglass, would have been necessary to construct such a large nest. Shortly after we removed the bulk of the nest to put in plumbing, we observed the squirrel, wisps of insulation in its mouth, making quick forays to a neighbouring cabin that remained low to the ground.

Signs of long time squirrel occupancy were present on the downslope side of the cabin as well. Here piles of scales from spruce cones formed drifts of loose fill ranging in depth from three to 14 inches (area B in Figure 1). The deepest pile was adjacent to the nest. Assuming an average depth of 6 inches, there was a minimum of 70 cubic feet of shelled spruce cones under the cabin.

The most amazing discovery, however, was the presence of two bones and two teeth placed on top of the beam in four adjoining joist spaces. This gave the impression of an orderly cupboard stocked with bones (C in Fig. 1). The bones showed evidence of rodent chewing. Squirrels collect bones and antlers as a source of dietary calcium and to maintain the chisel sharpness of their teeth. Bones, as part of the Red Squirrel diet, are particularly important during the lactation period.[2] The two bones had probably been collected after a barbeque as they had been cut by a saw. The teeth were from a deer species, most likely elk as they frequent the townsite. The squirrel may have obtained these teeth from a substantial distance indicating a large foraging territory as the park service would remove a carcass that was close to the townsite. The home range of the

Red Squirrel *Wayne Lynch*

Red Squirrel is reported to be from 2.73 to 6 acres.[1]

Over the years we have become accustomed to the rhythm of squirrel activity: the young of the year demanding constant maternal vigilance in early summer, the late summer 'pelting' rain of tight green cones from the tops of the spruce onto the roof and deck of the cabin, the timely harvest of the *Boletus* mushrooms, which grow at the base of the birch. Not all is work, for we have observed the squirrel basking, stretched on its belly along a major branch enjoying the warmth of autumn sunshine. We now have new appreciation for the ability of this resourceful species to "squirrel" things away.

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- *Bonnie Lawrence*, Box 286, RR6, Saskatoon, SK S7K 3J9 Email: <blawrence@sasktel.net>

LARGE EARTHWORM AT THE PAS, MB

The 4th of June 2004 produced a large earthworm on the cement sidewalk at Cressly Avenue and Third Street in The Pas. The worm was almost a foot long, thick as a pencil and the tail end, flat, resembling a leech. This was the first earthworm I collected that year. Other specimens have been taken in town previously and are preserved in fluid in my collection.

Is this the Dew Worm of fishermen? It may have been introduced here by live bait brought in from a commercial source. It seems to have been established here for the better part of ten years. This species makes extra-large and pointed heaps of excrement in lawns. These harden into cement in hot weather which has been known to make cutting the grass a greater chore.

- *Walter Krivda,* Box 864, The Pas, MB R9A 1K8

[Editor's note: It is generally believed that the earthworms found in much of Canada and the northern USA are non-native invasive species from Europe and Asia, introduced by settlers. Any native earthworms that may have existed in the region were probably killed during the last glacial period leaving the way open for colonization by these introduced species. The first earthworms probably arrived with imported plants or in ships' ballast and spread through trade in plants and plant products, and more recently through their use as bait for fishing.

Although most people believe that earthworms are always beneficial, research from Minnesota has indicated that earthworms may change the structure of hardwood forests that developed in the absence of earthworms and lead to a loss of biodiversity in forest floor species. Anyone wishing to contribute to the knowledge of earthworm distribution in Canada can participate by reporting their observations to <www.naturewatch.ca.>. Note contributed by Bill Watkins, Biodiversity Conservation Section, Wildlife and Ecosystem Protection Branch Manitoba Conservation, Winnipeg, MB]

NET BUTTERFLY RECORDS

Traveling insect collectors with several nets in use sometimes produce strange records. A classic case of this was a specimen of the Common Checkered Skipper ‘collected’ the first week July 1961, at Flin Flon, Manitoba by Steven Chermock, then 20, when he was visiting with his father, the veteran collector, Franklin Chermock.

On returning to The Pas in the evening and looking over our catches of the afternoon, amazingly a specimen of the Common Checkered Skipper was in the lot. I mentioned to them that in 18 years of local collecting at The Pas, 80 miles to the south of Flin Flon, I had never taken this species before. Indeed as a further confirmation that it does not occur this far north, I have never seen a local specimen from 1960 to 2005!

After looking over their eight insect nets they had with them, Steven remembered netting the solitary skipper 500 miles south of The Pas! Such ‘net records’ can be avoided by clearing a net completely before collecting with it in a new area.

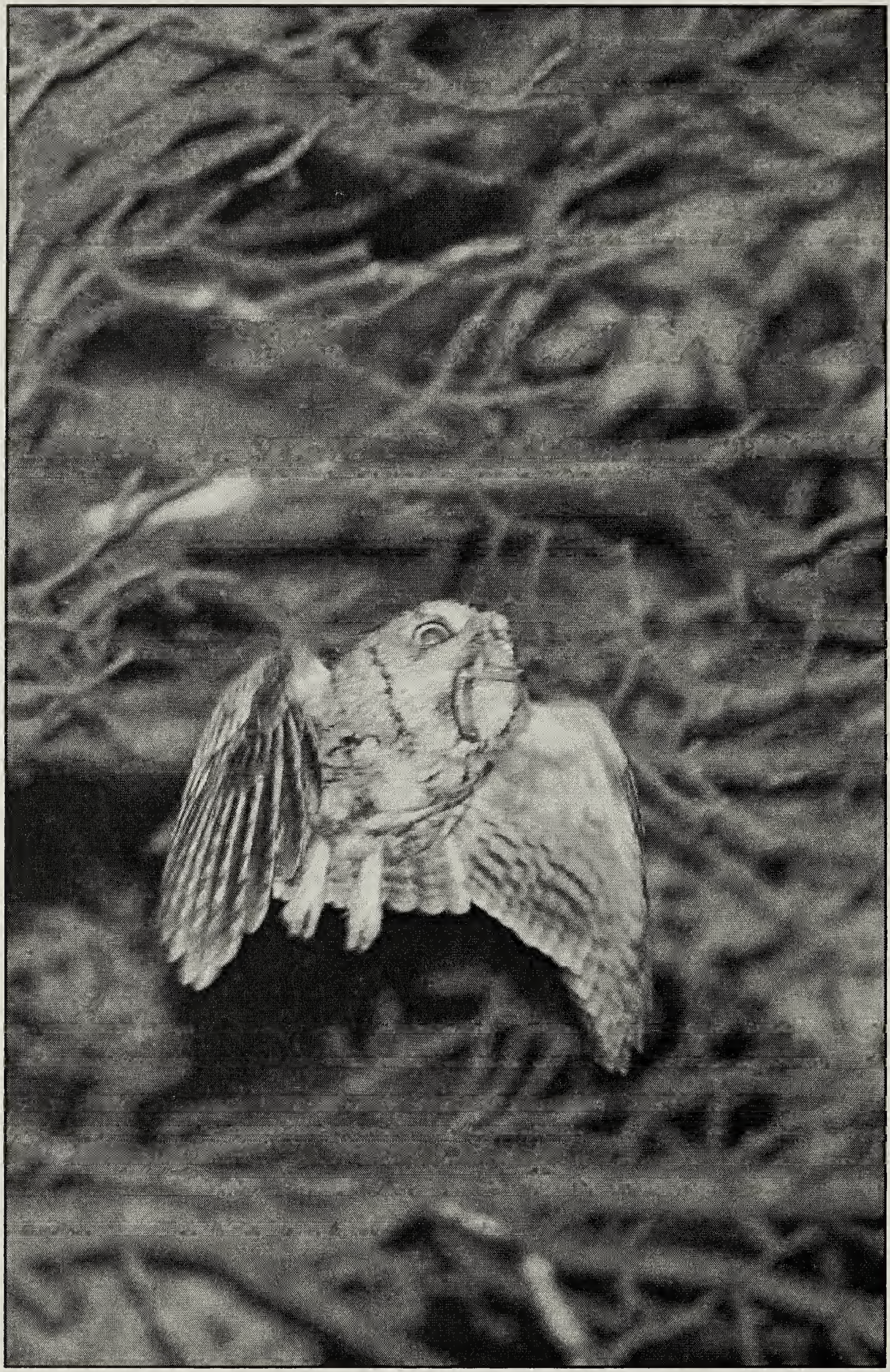
The Common Checkered Skipper doubtless occurs at Riding Mountain National Park, yet I failed to collect it in 1960-1964 when I was a part naturalist there. It also failed to show up at Prince Albert National Park where I was the first park naturalist in 1965.

- *Walter Krivda,* P.O. Box 864, The Pas,
MB R9A 1K8

[Editor’s Note: The north-easternmost Saskatchewan records of Common Checkered Skipper were taken by John Kozial as follows: one near Bjork Lake, 15 September 2001; two near Bjorkdale, 21 June 2003; one along Silica Sand Road, northeast of Armit, 29 June 2003; one near Bjork Lake, 8 August 2003. It seems to be extending its range northward. Caterpillars of the Common Checkered Skipper feed on plants of the mallow family so it should be looked for wherever this family is represented.]

“Grebes routinely eat their own feathers, often in large quantities, and also feed feathers to their chicks. The reason seems to be as protection for the stomach against the sharp bones of fish, which make up most of the rest of the grebe’s diet.

- Scott Weidensaul, *The Birder’s Miscellany*, p.55



Eastern Screech Owl carrying a night crawler to its nest, Winnipeg, 18 June 2004. *Christian Artuso*

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THE GYRFALCON

EUGENE POTAPOV and RICHARD SALE. 2005. Yale University Press. 288 pages. Hard cover, 15 cm x 22 cm., 13 b/w drawings and 16 pages of colour photographs and maps. US$ 45.00. ISBN 0-300-10778-1

The Gyrfalcon is the largest and–because of its extreme northern distribution–one of the least known members of the world-wide genus *Falco*. Yet, since the Middle Ages the bird has not lacked for human attention. Interest in this avian predator can be sharply divided into three categories: (1) Falconers who want to carry this "noblest" of falcons on their gloved fist and train it to hunt selected prey; (2) Scientists who collect museum skins and study the species' taxonomy; and (3) Biologists and birdwatchers who thrill at the rare chance of observing the falcon in its natural habitat, be it arctic tundra or prairie farmland.

As revealed by their product, the authors–Potapov, head of a Falcon Research Institute in Carmarthen, England and Sale, freelance writer and photographer–fit squarely in the middle group. The contents of their very technical book are, however, wide-ranging. The main chapter headings are: Systematics; Identification and Colours; Distribution; Population; Habitat; Feeding Habits; Breeding Cycle; Seasonal Movements; Competitors; Man and Falcons; Threats and Conservation.

Reflecting the authors' interest in taxonomy, the first chapter is 20 pages long and begins with the claim that "the story behind the species' nomenclature is exciting." Apparently, the current Latin name, *Falco rusticolus*, may be based on erroneous identification by none other than Linnaeus. In his 1758 publication, *Systema Naturae*, the famous Swedish scientist seems to have confused a northern race of the Peregrine Falcon or a Northern Goshawk with the Gyrfalcon. Therefore, and on the basis of extracts from Linnaeus' 1746-61 *Fauna Svecica*, the authors reject the use of *rusticolus*. Instead, they propose to reinstate the name *Falco gyrfalco*, which was already advanced around 1250 by Emperor Frederick II of Hohenstaufen in his classical treatise on falconry, *De Arte Venandi cum Avibus*.

There are few bird species in the world that show such high variability in plumage as the Gyrfalcon. Travelling to every country within the bird's range, the authors examined and measured 1,865 museum skins. The results are discussed in a chapter of 40 pages including six pages with 65 small photographs of plumage details in colour. By comparison, photos of the entire (living) bird are rather few and none is larger than half a page in size. This book is definitely not a picture gallery of great Gyr photographs.

The text includes some new and fascinating insights on the subject of plumage variation. Ranging in colour from the extremes of white to almost black, feather patterns can be either plain, striped, barred or spotted. Moreover, some specimens are asymmetric, with one wing much darker than the other or a tail that is differently marked from one side to the other. Incidentally, the terms "colour phase" or "morph," often used by birders, are not correct. The better term is "variant," because the differences are "continuous polymorphism."

The white Gyr is the most striking in appearance, at least to people. Among Gyrs, it does not seem to matter much, for grey birds mate with white ones. Apparently, like many other bird species, Gyrs use ultraviolet clues for conspecific recognition and mate selection. The question of why some Gyrs are white is not as simple as it seems. The authors argue that the white colour is not just an adaptation to camouflage against a snowy background. White Gyrs are not white in the UV part of the spectrum, and they are extremely conspicuous to other UV sensitive animals, such as ptarmigan and rodents.

The Gyrfalcon's home range is circumpolar, but the authors point out that it is not the most northerly-nesting falcon. That claim goes to the Peregrine. Generally, the Gyr stays within or near the northern tree line, and it may nest in trees as well as on cliffs. In Canada, its breeding range extends well south of sixty, as far down as the Spatsizi Plateau in British Columbia. There, its habitat is the alpine tundra, and its main prey–as elsewhere–the ptarmigan.

The book devotes 15 pages to Gyr distribution, 11 to population estimates, and 22 to habitat preference and nesting. For instance, the authors go into great detail as to the Gyrs dependency on stick nests built by ravens or other birds. Aspects of breeding behaviour, such as nest defence, feeding frequency, and reactions to human visitors, are discussed in an equally comprehensive manner.

In the section on food habits, the authors quote field studies from Asia, Europe and North America. Canadian researchers are frequently cited, including D.M. Bird, D.A. Boag, R.G. Bromley, R.C. Cotter, R.D. Hayes, E. Kuyt, D.H. Mossop, D. Muir, J.N. Platt, K.G. Poole, C.C. Shank and J. K. Schmutz. In addition, the authors borrow heavily from the publications of American authorities, in particular T.J. Cade. The reference list is 30 pages long! One of the plus points of the book is that it also includes much Russian information formerly unavailable to western readers (T.J. Cade, pers. comm.).

If I have one reservation, it is that the wealth of detail is often confusing because the authors make no attempt at summarizing or organizing the material. For the reader, it would have been easier to absorb the repetitive and sometimes conflicting data–such as the percentage of ptarmigan remains found at nest sites–if they had been placed in tables.

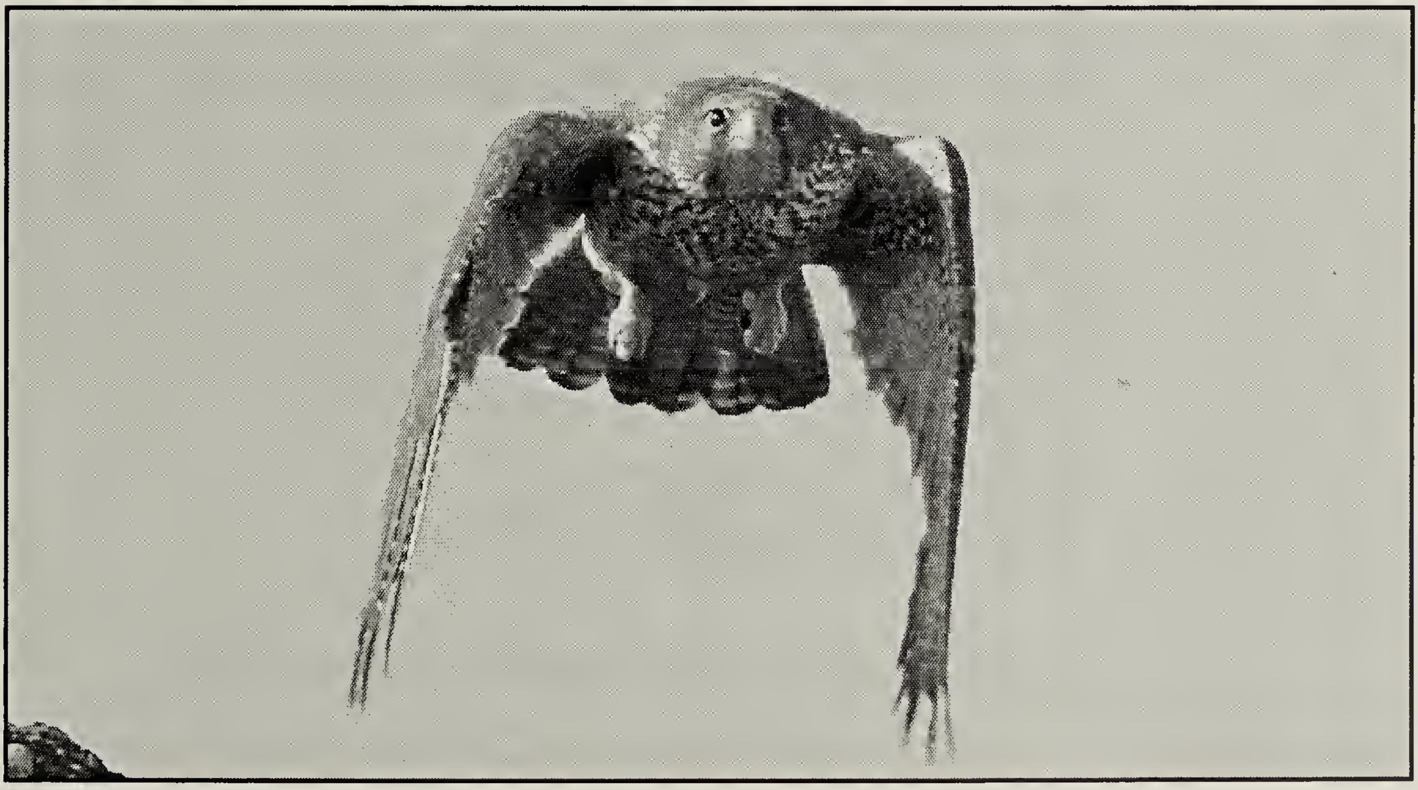
The last quarter of the book covers a variety of subjects ranging from banding data and satellite telemetry to relations with other raptors, falconry, and conservation. The section on persecution and human-induced threats includes some shocking information on the high incidence of Gyrs (and Snowy Owls) caught on arctic fox traps and thrown out as "trash" or used as bait, here in Canada and Eurasia. In parts of Russia, all too many Gyrs are caught in snares set for ptarmigan.

During the medieval heyday of falconry, the Gyr was the ultimate favourite of royal mews in Europe, which were staffed by hundreds of keepers and contained large numbers of birds. The book gives much detail on the yearly trade of Gyrfalcons that were captured in Iceland. In recent times, the sport of falconry has experienced a revival, and Gyrfalcons are again highly desired. Curiously, Iceland is now one of the countries within its breeding range where its capture is not permitted. When the matter came up again in the Icelandic parliament, one member argued: “There is a demand, we have a supply, let’s make some money.” The motion was defeated by the counter argument that the same logic applied to the export of Iceland’s virgin daughters.

The one section which I found disappointing deals with the living bird, in particular how it hunts and captures its prey. Granted, existing literature on this subject is meagre. Most publications describe no more than one or two hunts or kills, yet they are quoted repeatedly. Two papers from central Alberta based on large samples of hunts are mentioned only in a short paragraph, leaving out descriptions of unique hunting methods, figures on the hunting success rate of Gyrfalcons, and a report on a major interference problem with Bald Eagles stealing prey from wintering Gyrs. Furthermore, the book erroneously states that one of the Alberta papers includes the capture of 17 mallards besides the recorded 15 pigeons. Such a mistake makes one wonder about the accuracy of other material. It again demonstrates that any serious student of this and other natural history subjects needs to check the original references instead of relying on second-hand information.

Lastly, for *Blue Jay* readers, a serious shortfall of the book is that it includes no information on migrating and wintering Gyrs in our prairie provinces, nor anywhere else in southern Canada. Nevertheless, despite these shortcomings, I am sure that every raptorphile would enjoy perusing this detail-rich publication and add it to his or her professional library.

Reviewed by Dick Dekker, 3819-112A Street, Edmonton, AB T6J 1K4. E-mail: <tj_dick_dekker@hotmail.com>



Gyrfalcon, Sherwood Park AB, March 10, 2004 *Gerald Romanchuk*

POETRY

A TINY SPIDER

A tiny spider rides on a wisp of gossamer
into the setting sun
A fragile entity in the universe,
trusting its destiny to the wind.
Knowing no tomorrow, nor yesterday,
only the reality of each day it is granted life

- Bernard de Vries, 2000

INSECT TRAP

Not a loud mouth
like the raucous Magpie and Raven
screeching to announce their presence.
But a quiet mouth
filled with liquid notes,
soft trills and twitters
bubbling rapidly, continuously.

Not a small mouth
like the Hummingbird with long, slender bill
reaching into bell flowers for nectar.
But a wide mouth
to trap flying insects,
short beak with bristles for funnelling
aerial plankton into the gaping maw.
Chattering insectivore pro,
Trapper Barn Swallow.

- Jean MacKenzie, An Exaltation of Birds, 1999

OVENBIRD

Tired of housekeeping chores
tending an oven (almost built)
she–smartly arrayed in
russet headdress
olive-brown coat, open
revealing a clean
black-striped white dress–
leaves her forest-floor home
and steps with showy pink legs
to the roadway

This grass-edged trail's her promenade
to be walked with much to-do
half-whirls and stops
and bobs (of tail)
and dabs (with beak)
her mincing gait
that of an old, old song's
old lady's passing by
some business here
and business there
an avian outdoor kind of
window shopping

Then satisfied, refreshed
she seeks once more
her oven-nest embedded in dry leaves
arched-over, hidden, and secure

- Victor C. Friesen

THE JOY OF RAIN

A quiet mist of rain descends
graying the fragrant air
blacking furrowed trunks of trees
beading the pendant foliage

Each dripping tree-umbrella is
a sheltering green cave
cool, moist, and lattice-windowed
a saunterer's brief snug haven.

- Victor C. Friesen

A SIMPLE THING

In mid-March I happened to see
a red squirrel atop a snowbank
just as I've often seen before
but this one surprised me by
simply stopping, lowering its head
and then eating snow...of course,
I reasoned, that's how they get
water in winter...but it was
a neat thing to see.

- Bob Nero

"YELLOW HAMMER"

There are laws for the human
about noise pollution
but this shrill bird
has never heard
of such edicts
for he projects

loudly
and repeatedly,
“Flick! Flick! Flick!
or “*Wick! Wick! Wick!”*
as variation
in pronunciation.

During courtship time,
considering himself handsome
and glamourous,
he becomes more clamourous,
shouting, “*Kee-oo! Kee-oo!*”
and beating a loud tattoo,
as amourous proof,
on a wooden house roof,
or even on a metal pole.
Has he no emotional control?
Must he so reverberate
his grand passion for his mate?

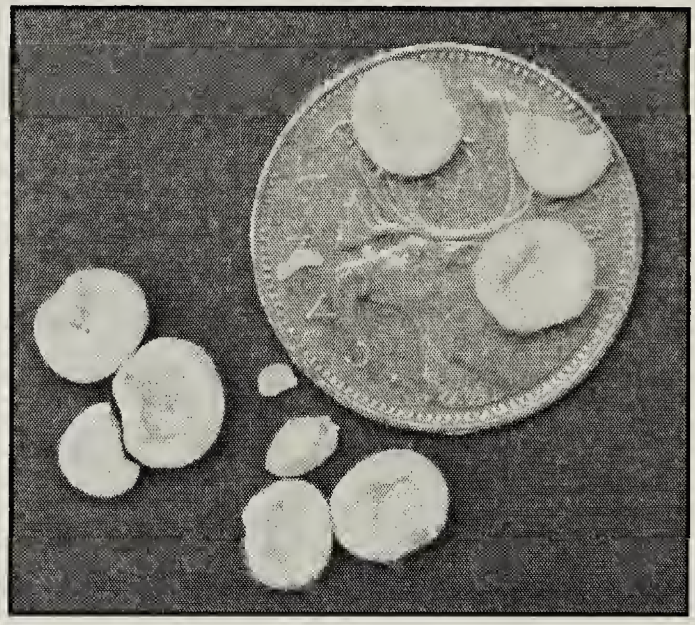
Such a crazy lover
and intemperate drummer
should be confined
incarcerated
summarily
temporarily
for sentimental inebriation
and lovesick intoxication.
Charge him for shredding
the quiet of early morning.
Raucous sleep-wrecker–
Yellow-shafted Flicker.

- Jean MacKenzie, An Exaltation of Birds, 1999

MYSTERY PHOTO

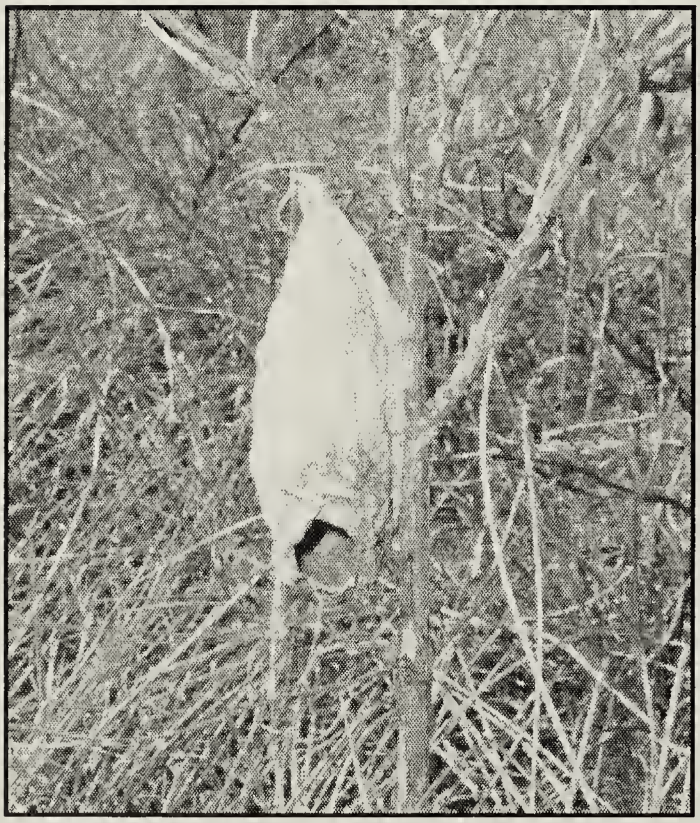
JUNE 2006 MYSTERY PHOTO

These bone-hard, smooth, white disks were found on the shore of Last Mountain Lake in close proximity to bits and pieces of a crayfish. What are they and what put them there?



ANSWER TO THE MARCH 2006 MYSTERY PHOTO

The mystery object is an empty pupal case of a Glover's Silkmoth, *Hyalophora columbia gloveri*. The cocoon, nearly 6 cm long, was attached to a short Wolf Willow (*Elaeagnus commutata*) stem in a small patch of shrubs that included Western Snowberry (*Symphoricarpos occidentalis*) in the Excel PFRA pasture near Ormiston, SK. The moth, found by Camille Pouteaux, had climbed a different stem near the patch fringe (Figure 1).



Glover's Silkmoth cocoon case
Ross Dickson

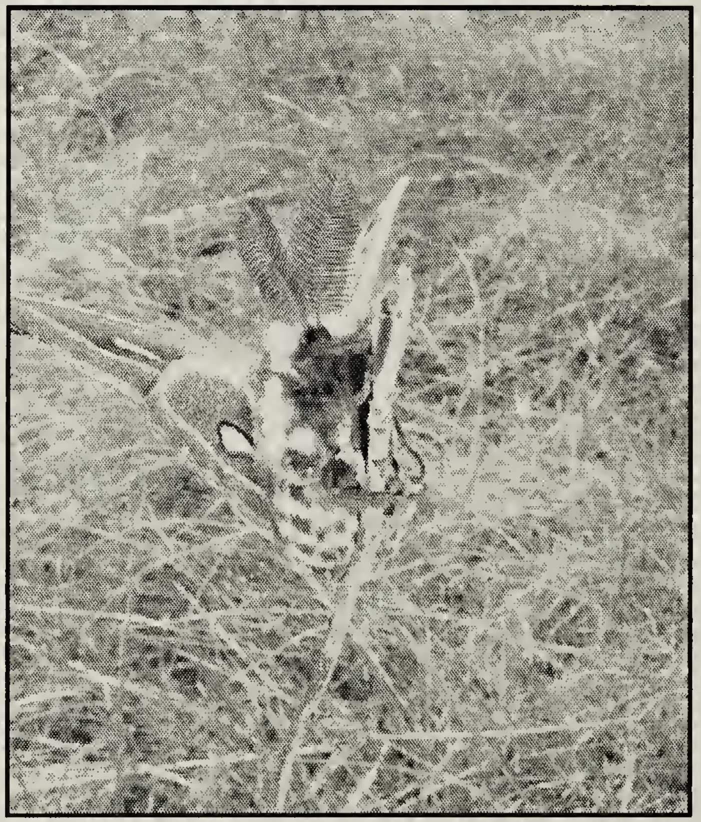


Figure 1. The Glover's Silkmoth clinging to the Wolf Willow stem, 14 May 2005. Ross Dickson

Just emerged from its cocoon, the moth was slowly spreading its wings (Figure 2). The long feather-like antennae that identify it as a male, can detect a pheromone emitted by a receptive female from several kilometres away. Its wingspan was about 15 cm. The adult has no mouth parts and does not eat. Silkmoths are somewhat cold-tolerant, a useful trait since they need to be active at night. The usual peak of adult sightings in western Canada is late May to mid-June.

Glover's Silkmoth is the western subspecies of Columbia Silkmoth (*H.c. columbia*) and has a wide range extending from northern Alberta to northern Mexico, but may be rare in some areas. Glover's large caterpillar (Figure 3) feeds primarily on Wolf Willow in shrubby areas of the southern portion of the Prairie Provinces. The dull, waxy green caterpillar, with short, pale yellow and white tubercles on each body segment, grows to 5-6 cm long. Columbia Silkmoth caterpillars eat Tamarack (*Larix laricina*) in boreal regions.

The similar Cecropia Silkmoth (*Hyalophora cecropia*) has a pinkish-red subterminal band on its wings that Glover's lacks. It is now very rare (with no recent records in Alberta and Saskatchewan) in the northern part of its range. This status contrasts with the 1930s and 1940s when its caterpillars denuded Manitoba Maples (*Acer negundo*) in farm shelterbelts (Ron Hooper, pers. comm.).

- Ross Dickson, Box 280 Simpson SK S0G 4M0

John Kozial of Bjorkdale writes: [The mystery photo] appears to be an empty

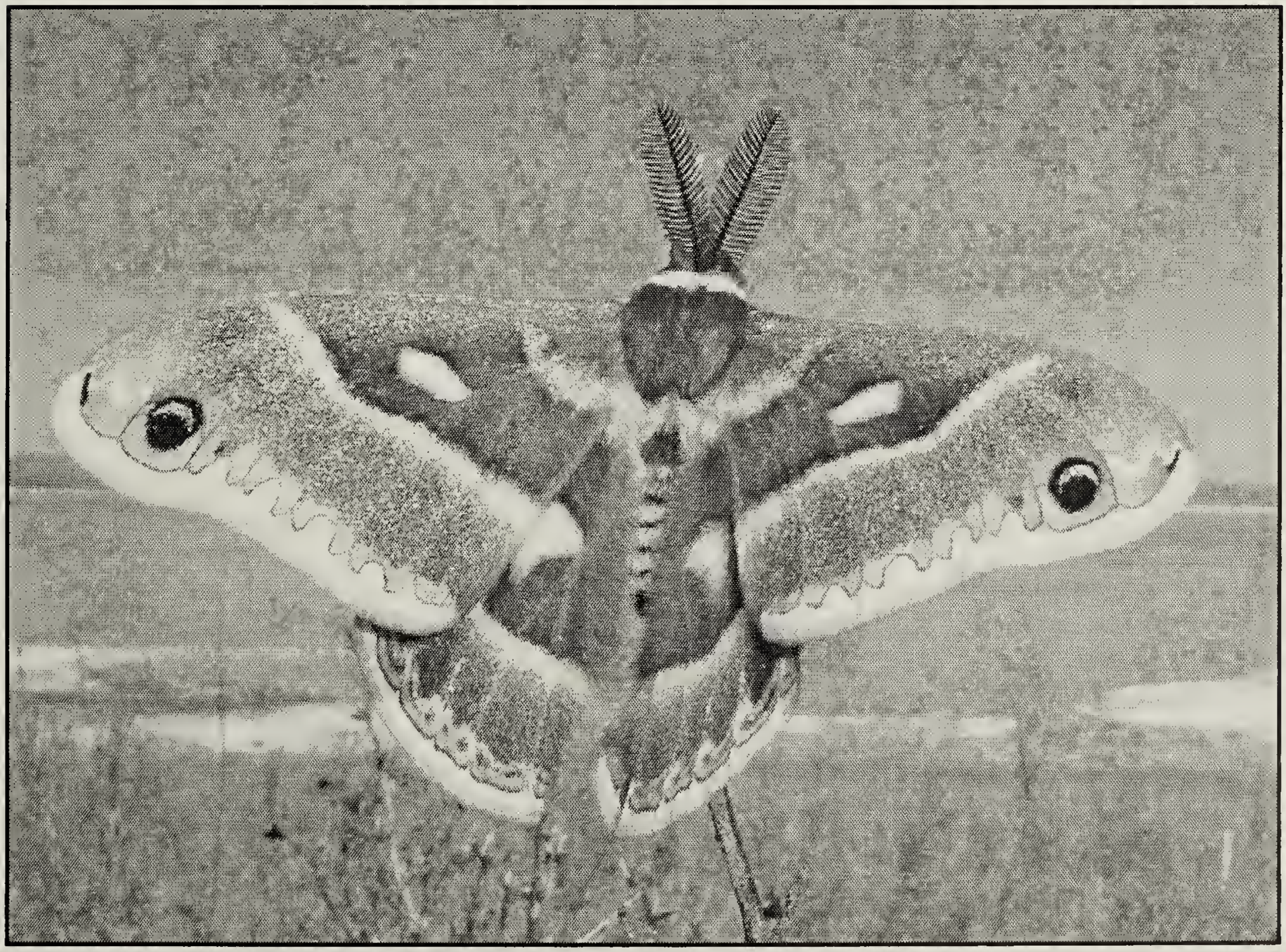


Figure 2. The Glover's Silk Moth showing the wings *Ross Dickson*

cocoon of one of our most beautiful and uncommon Giant Silkmoths – Glover's Silkmoth, (*Hyalophora columbia gloveri*). I have collected about a dozen specimens throughout the years at Bjorkdale. In the early 1980s I found two mature larvae feeding on Wolf Willow just west of Ft. Walsh (former R.C.M. P. horse training land). I brought them home to Bjorkdale and had them pupate and emerge the following June. In the mid-1980s, I reared this species for two years from a female caught in one of my light traps. The larvae were fed Wolf Willow (*Elaeagnus commutata*), which they did best on, and a related species Canada Buffaloberry (*Shepherdia canadensis*), which they survived on, but were not healthy. Interestingly enough, Wolf Willow does not occur in my immediate area and the literature says they may feed on various willow (*Salix*) species. I was given a large cocoon from a lady in Nipawin, SK a number of years ago, from which a beautiful female Glover's emerged the following June (Nipawin is the farthest north record I have for this species).

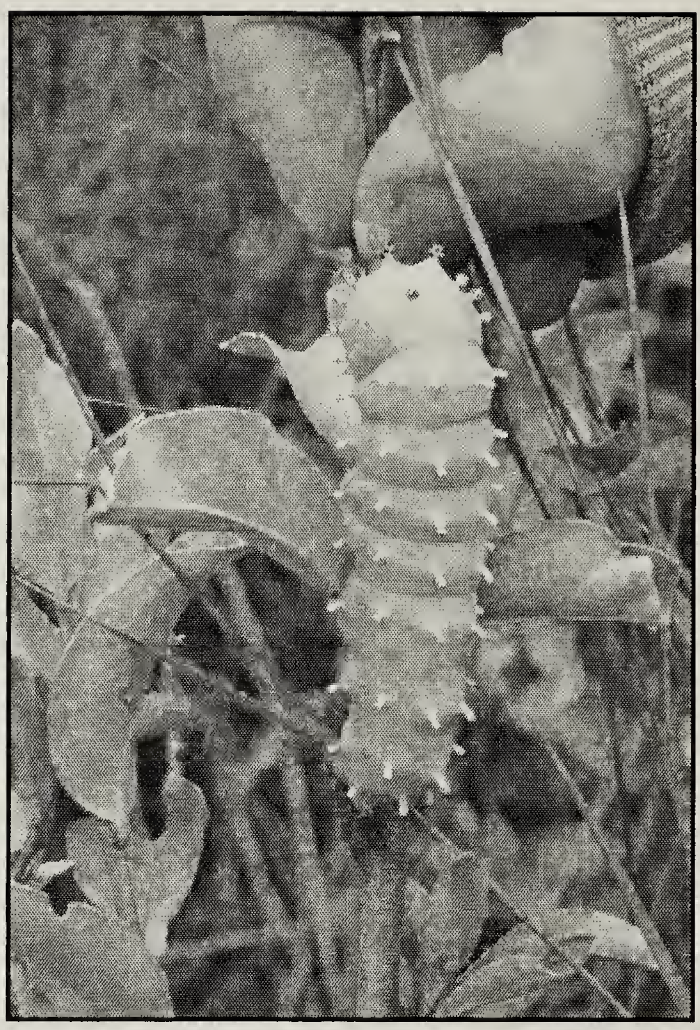


Figure 3. Glover's Silkmoth caterpillar in a small roadside stand of Wolf Willow near Danielson Provincial Park on June 22, 2002. Another Glover's caterpillar was found on July 20, 2005 in the Wreford PFRA Pasture south of Nokomis. Kerry Hecker

* * *

Announcement: Back issues of *Blue Jay*

All is not lost if you missed the deadline for requesting back issues of Blue Jays (see the first page in the March 2005 issue). Although the giveaway was very successful–issues were supplied to 16 institutions and 41 individuals in 7 provinces and 4 states–there are still thousands of copies left. Myron Barton has kindly offered to share house space with the boxes that remain. IF you are looking for back issues, or IF you have back issues to donate for others, please contact Myron at <myron@inet2000.ca> or Box 7, Macdowall, SK, S0K 2S0 as he is taking over the management the extant collection.

Nature Saskatchewan would like to thank Myron for his help and everyone who contributed to the cause, by helping to pay for shipment or by providing back issues.

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